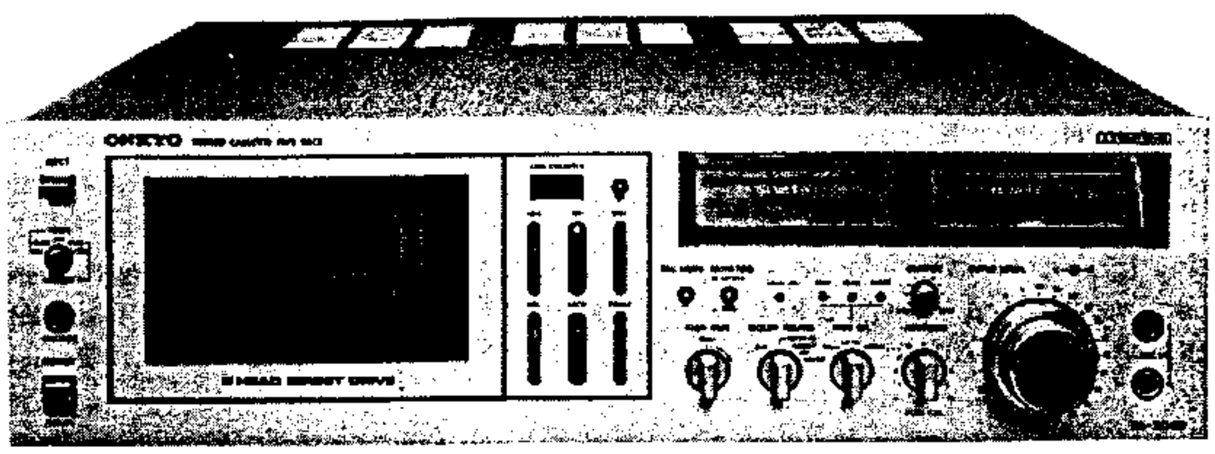
ONKYO. SERVICE MANUAL

STEREO CASSETTE TAPE DECK

TA-2060 TA-2070



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ONKYO®
AUDIO COMPONENTS

SPECIFICATIONS

120V model

Track System:	4-track, 2-channel stereo
Recording System:	AC bias
Erasing System:	AC erase
Tape Speed:	4.8 cm/sec.
Wow and Flutter:	0.04% (WRMS)
Frequency Response:	20 – 17,000 Hz (20 – 16,000 Hz ± 3 dB) (normal position tape) 20 – 19,000 Hz (20 – 17,000 Hz ± 3 dB) (high position tape) 20 – 21,000 Hz (20 – 19,000 Hz ± 3 dB) (metal position tape)
Signal-to-Noise Ratio:	60 dB (Dolby NR out, metal position tape) A noise reduction of 10 dB above 5 kHz and 5 dB at 1 kHz is possible with the Dolby NR in
Input Jacks:	Microphone Jacks: 2 Minimum input level: 0.3 mV/600Ω Input impedance: 5 kΩ Optimum mic impedance: 600Ω – 50 kΩ Line In: 2 Minimum input level: 50 mV Input impedance: 50 kΩ
Outputs:	Line Out: 2 Output level: 1.1 V (at 0 dB) Optimum load impeadance: over 50 kΩ Headphone Jack: 1 8Ω – 200Ω
Motor:	2 Motor System DD Motor: 1 DC Motor: 1
Heads:	Rec/PB head: Sendust combination head Erase: Ferrite head
Components:	TR: 69 Diodes: 46 IC: 16 LED: 9
Power Supply:	120 V/60 Hz
Power Consumption:	35 W
Dimensions:	418(W) x 120(H) x 330(D) mm 16-1/2" x 4-3/4" x 13"
Weight:	6.5 kg (14.3 lbs.)
Accessories:	Pin-type connecting cords: 2

* Specifications and external appearance are subject to change without notice because of product improvements.

Other model

Track System:	4-track, 2-channel stereo
Recording System:	AC bias
Erasing System:	AC erase
Tape Speed:	4.8 cm/sec.
Wow and Flutter:	0,04% (WRMS)
Frequency Response:	20 – 17,000 Hz (20 – 16,000 Hz ± 3 dB) (normal position tape) 20 – 19,000 Hz (20 – 17,000 Hz ± 3 dB) (high position tape) 20 – 21,000 Hz (20 – 19,000 Hz ± 3 dB) (metal position tape)
Signal-to-Noise Ratio:	60 dB (Dolby NR out, metal position tape) A noise reduction of 10 dB above 5 kHz and 5 dB at 1 kHz is possible with the Dolby NR in
Input Jacks:	Microphone Jacks: 2 Minimum input level: 0.3 mV/600Ω Input impedance: 5 kΩ Optimum mic impedance: 600Ω – 50 kΩ Line In: 2 Minimum input level: 50 mV Input impedance: 50 kΩ DIN Jack: 1 Minimum input level: 0.1 mV/1 kΩ Input impedance: 1 kΩ
Outputs:	Line Out: 2 Output level: 1.1 V (at 0 dB) Optimum load impedance: over 50 kΩ DIN Jack: 1 Standard output level: 1.1 V (at 0 dB) Optimum load impedance: more than 50 kΩ Headphone Jack: 1 8Ω – 200Ω
Motor:	2 Motor System DD Motor: 1 DC Motor: 1
Heads:	Rec/PB head: Sendust combination head Erase: Ferrite head
Components:	TR: 74 Diodes: 49 IC: 16 LED: 9
Power Supply:	220 V/50 Hz, 120/220 V 50/60 Hz or 240 V/50 Hz
Power Consumption:	35 W
Dimensions:	418(W) x 120(H) x 330(D) mm 16-1/2" x 4-3/4" x 13"
Weight:	6.5 kg (14.3 lbs.)
Accessories:	Pin-type connecting cords: 2

* Specifications and external appearance are subject to change without notice because of product improvements.

Mechanism

1. Back Tension:	3 – 6 g-cm
2. Play Torque:	38 – 45 g-cm
3. F.F Torque:	70 – 140 g-cm
4. Rewind Torque:	70 – 140 g-cm
5. Auto-Stop Time:	less than 4.5 sec. (Play) less than 2.5 sec. (F.F/Rewind)
6. Timer-Start Time:	less than 5 sec.
7. Rewind Time:	less than 90 sec. (Use a C-60 cassette tape)

Current Consumption

	Reel motor		Capstan motor
PLAY	180 mA		110 mA
FF	110 mA		—
REW	110 mA		110 mA
AUTO STOP	PLAY	190 mA	120 mA
	FF. REW	120 mA	—

FEATURES

Three Head Design with Sendust for Superior Metal Tape Performance
Three heads means you can monitor the actual recorded signal as you record instead of having to rewind the tape to check your recording. The combination 3-head system also features separate record and playback gaps in a special sendust head formulation boasting high saturation flux density and abrasion resistance perfect for metal tape compatibility.

AUTO-ACCUBIAS System
The Onkyo AUTO-ACCUBIAS system lets you quickly and accurately match the recording bias to any tape formulation to optimize frequency response and other performance parameters to get the most out of all your tapes.

Dolby NR/HX System
In addition to the standard Dolby NR (Noise Reduction) system which reduces tape hiss noise, the TA-2060 is also equipped with the new Dolby HX (Headroom Extension) circuitry which significantly improves dynamic range in the high frequencies to permit higher recording levels above 10 kHz even when you don't use expensive tape formulations.

Fade Out Mechanism
This convenient function enables smooth fade-ins and fade-outs to be inserted at the beginning and end of each tape to eliminate sudden cut-offs and starts.

Remove Control Unit Terminal
With an optional remote control unit (the RC-5T), you can switch all tape transport modes from the comfort of your listening position.

COMMON MODES OF OPERATION

Auto ACCUBIAS Operation
1. Set the Memory switch to the STOP position and the Tape Counter to '000'.
2. Insert the tape in the cassette holder and set the Tape Selector switch to the appropriate position.
   (Use the NORM setting for FeCr tapes.)
3. Set the Dolby NR/HX switch to the OUT position.
4. Set the Monitor button to the SOURCE position.
5. Pull out on the Auto ACCUBIAS Control knob to start the test signal generator. A high (approx. 10 kHz) and low (approx. 333 Hz) signal will be generated alternately and register on the level meters.
6. Press the Record and Play buttons together to record the test signal. This will not be possible if the erasure prevention tabs have been broken off.
7. Change the Monitor button to the TAPE position. The test signal can now be monitored through the speakers or headphones. While watching the level meters, adjust the Auto ACCUBIAS Control knob so the position of the needles does not change when the test signal switches between high and low. Turn in the + direction when the high frequency is larger than the low and in the – direction when the low frequency is larger.
   The bias is now set to the optimum value for the tape in use. For tapes where the deflections can not be matched, adjust the Auto ACCUBIAS Control to the point where the meter needles move back and forth the least.
8. With the Auto ACCUBIAS Control knob in the setting described above, depress the knob to return in to the in position.
9. Press the Rewind button and the tape will automatically be rewound to '999'.
10. Turn the Memory switch OFF.
11. Begin recording operations.
12. The position of the Auto ACCUBIAS Control knob has no effect on sound quality during playback.

About the Dolby NR/HX Switch
The Dolby Noise Reduction system has been developed to reduce tape hiss. The Dolby system boosts the higher frequencies (where the hiss is most apparent) during the recording process and reduces them again during playback thereby reducing the background hiss at the same time. In the TA-2060 the Dolby NR circuitry reduces the background hiss by 5 dB at 1 kHz and about 10 dB above 5 kHz.
Any tape recorded using the Dolby system must be played back using the Dolby system, and any tape not recorded using the Dolby system must not be played back using the Dolby system because the Dolby system would suppress most of the high range frequencies.
The Dolby HX (Headroom Extension) system functions to significantly improve the usable dynamic range of any tape, particularly at high frequencies. Note that the Dolby HX system does not operate for metal tapes because metal formulations already have excellent high frequency characteristics. Dolby HX also optimized performance at low and middle frequencies for minimum distortion, modulation noise and drop-out effects. To use this system when recording, set the Dolby NR/HX switch in the NR + HX position. To enjoy the benefits of these noise reduction systems during playback, the Dolby NR/HX switch should be in the DOLBY NR IN/FILTER OUT position. Tapes recorded using the Dolby HX system can be played back on tape decks not equipped with HX circuitry if the deck is set to the Dolby NR IN position.

Fade Out Function
To fade out the sound at the end of a recording, depress the Fade Out control and turn it slowly clockwise as far as it will go. Fade Out should be performed while listening to a tape so the speed of the fading out (i.e., rate at which the control is turned) can be matched to each tape.

ADJUSTMENT PROCEDURES

PRECAUTIONS

1. Before adjustment, clean the following parts with an alcohol moinstend swab.
   * record/playback head
   * erase head
   * pinch roller
   * capstan
   * rubber belt
2. Do not use magnetized screwdriver for adjustments.
3. Damagnetize record/playback head with a head demagnetizer.
4. The switches and controls should be set as follows unless otherwise specified.

TAPE SEL.	NORM
DOLBY NR/HX	OUT
FADE OUT	OUT
OUTPUT	MAX
INPUT LEVEL	0
ACCUBIAS	Center
TIMER/MEMORY	OFF

TEST EQUIPMENT/TOOLS REQUIRED:

Audio oscillator
Digital frequency counter
Oscilloscope
Attenuator
AC voltmeter
Non-magnetic screw drive
Blank tapes (completely erased)

NORMAL	UD-XL/ I
HIGH	UD-XL/ II
METAL	MX

Test tapes

VTT-658	:	10 kHz, –15 dB
MTT-111	:	3 kHz, –10 dB
MTT-150	:	Dolby level calibration 400 Hz tone 200 nWb/m
TW-2111	:	Torque meter
MC-12C or MC-9C	:	Mirror tape

1. **Hall IC position adjustment**
   Press the eject button to open the cassette lid, then lift the lid up and out to remove. Remove the two screws holding the cassette chassis and holder plate.
   Adjust the clearance between the hall IC and magnet becomes 0.3 to 0.9 mm as shown below.

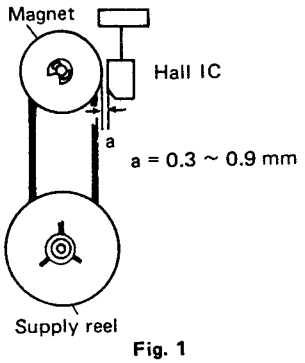


Fig. 1

2. **Back tension adjustment**
   Play the torque meter TW-2111 back.
   Adjust the VR21 on the motor control pc board so that the torque of supply reel hand becomes 3 to 6 gr-cm.

3. **Play torque adjustment**
   Play the torque meter TW-2111 back.
   Adjust the R721 so that the torque of take-up reel hand becomes 40 gr-cm.

4. **Tape speed adjustment**
   Play the 3 kHz portion of the test tape MTT-111 back.
   Adjust the VR1 on the motor control pc board so that the counter indication reads 3,000 Hz.

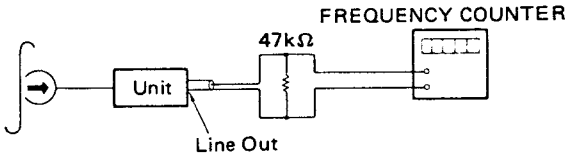


Fig. 2

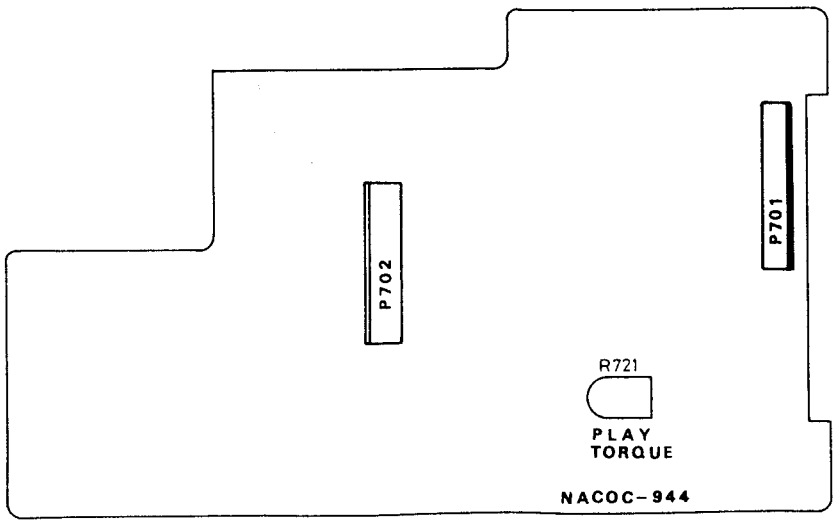


Fig. 3 Control pc board-adjustment point

5. **Head azimuth adjustment**
   1) Play the test tape VTT-658 back.
   2) Adjust the head azimuth screw (3) so that the phase relationship between L- and R-channels approximates 0 degrees as indicated on the oscilloscope.
   3) At this time confirm that play back output level is approximately the maximum value on the AC voltmeter.
   4) Then confirm that the phase difference of the respective frequency is with in the rated value. 90 degrees or less in the range of 40 Hz to 10 kHz is required.
   5) Secure the screw with the locking paint.

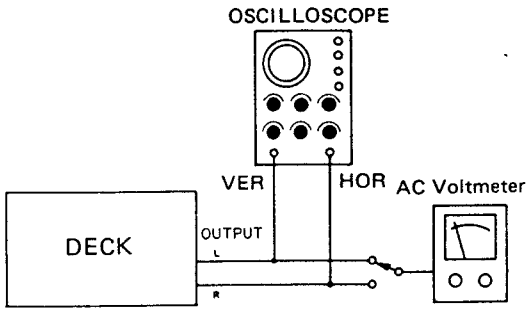


Fig. 4

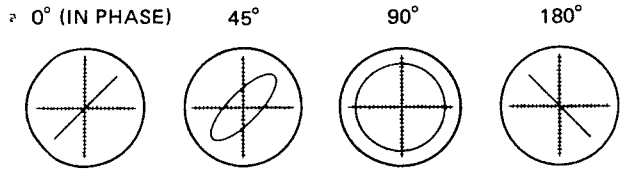


Fig. 5 Confirming phase relationship

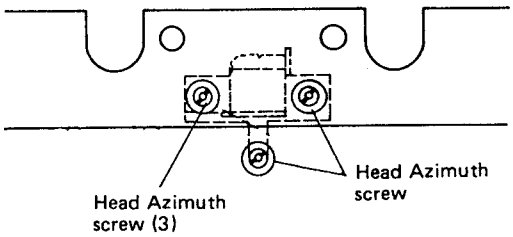


Fig. 6

Note: Perform the adjustment as shown below when the record/playback head is replaced.
1. Insert the mirror cassette tape into the cassette holder.
2. Play the mirror tape back.
3. Adjust the three azimuth screws so that the tape passes to the center of cassette guide as shown below.

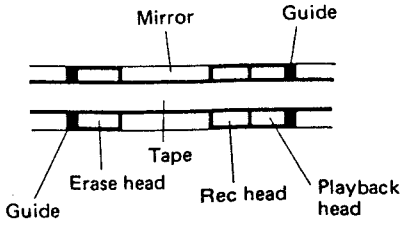


Fig. 7

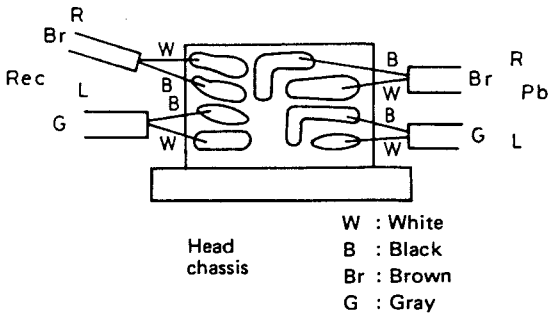


Fig. 8 Wiring view

4. Play the test tape VTT-658 back.
5. Adjust the head azimuth screws so that the AC voltmeter reads maximum.
6. Insert the normal blank tape into the cassette holder.
7. Apply the 10 kHz signal to the line-in terminals.
8. Set the monitor switch to the source position.
9. Adjust the AF oscillator output or input level volume so that the peak level meter reads 0VU.
10. Then set the attenuator for −10 dB input level, put the tape deck into the recording mode.
11. Set the monitor switch to the tape position.
12. Adjust the three azimuth screws so that the left and right channel outputs become the same and maximum level.

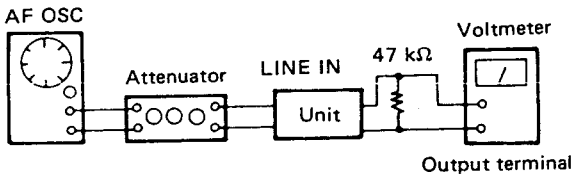


Fig. 9

6. **Playback output adjustment**
   Play the test tape MTT-150 back.
   Adjust R119 and R120 so that the AC voltmeter reads 775 mV.

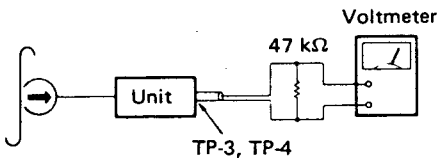


Fig. 10

7. **Peak meter adjustment**
   1) Apply the 5 kHz signal to the line-in terminals.
   2) Adjust the AF oscillator output or input level volume so that the AC voltmeter reads 1,100 mV.
   3) Adjust the R341 and R342 so that the peak meter reads 0VU.

Note: Connect the test equipment as shown Fig. 9.

8. LAW adjustment
   1) Connect the test equipment as shown in Fig. 10.
   2) Apply the 5 kHz signal to the line-in terminals.
   3) Set the monitor switch to the source position.
   4) Adjust the attenuator so that the AC voltmeter reads 23.4 mV.
   5) Connect the test equipment as shown in Fig. 11.
   6) Turn the Dolby NR switch to the Dolby position.
   7) Adjust the R351 and R352 so that the AC voltmeter reads 60 mV.

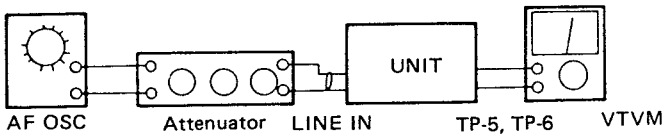


Fig. 11

9. Accubias adjustment
   1) Pull out the auto accubias control knob and set the monitor switch to the source position.
   2) Set the R517 and R516 to the position as shown below.

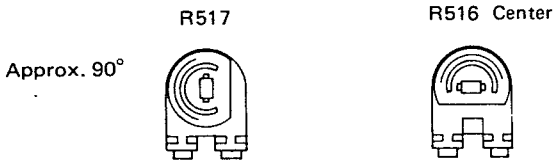


Fig. 12

   3) Adjust the R516 so that the large indication of right channel meter becomes 0VU.
   4) Adjust the R517 so that the meter of 333 Hz and 10 kHz indicates same calibration.
   5) Adjust the R340 so that the meters of right and left channel indicate same calibration.
   6) After adjustment, depress the accubias knob.

10. Record level and bias current adjustment
   1) Insert the normal blank tape into the cassette holder.
   2) Set the monitor switch to the source position.
   3) Apply the 1,000 Hz signal to the line-in terminals.
   4) Press the pause and record buttons and put the tape deck into recording mode.
   5) Adjust the AF oscillator output or input level volume so that the VU meters read 0VU. (AC voltmeter reads 775 mV.)
   6) Then set the attenuator so that the AC voltmeter reads 77.5 mV.
   7) Release the pause button and record on the tape.
   8) Set the monitor switch to the tape position.
   9) Adjust the R263 and R264 so that AC volmeter reads 77.5 mV.
   10) Next change the frequency of 400 Hz, and record again.
   11) Read the output level when the monitor switch is set to the tape position.
   12) Next change the frequency of the 10 kHz and record again.
   13) Adjust the R574 and R575 so that the 400 Hz and 10 kHz levels become is same.

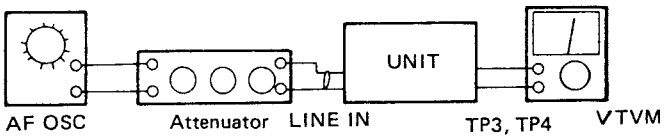


Fig. 13

11. Lid openning speed adjustment
   Adjust the screw as shown below so that the lid openning speed becomes 0.3 to 2 sec.

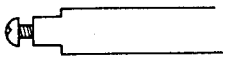


Fig. 14

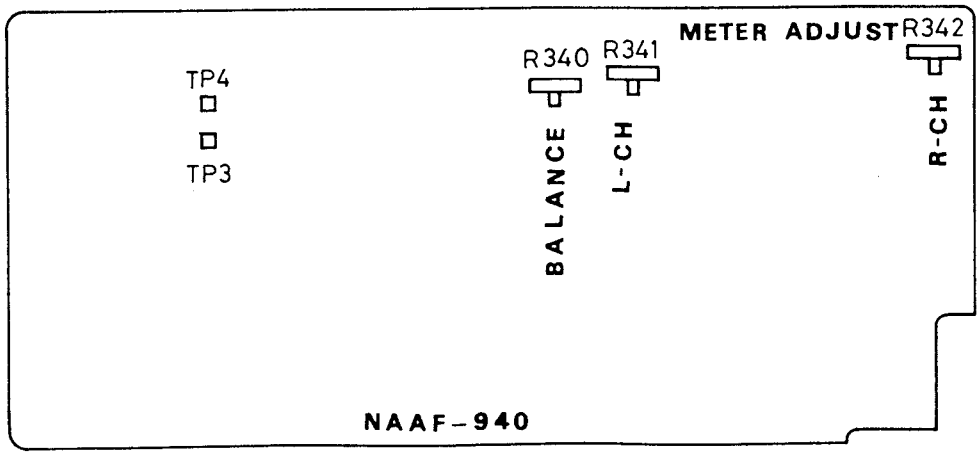


Fig. 15 Audio amplifier and meter drive pc board-adjustment points

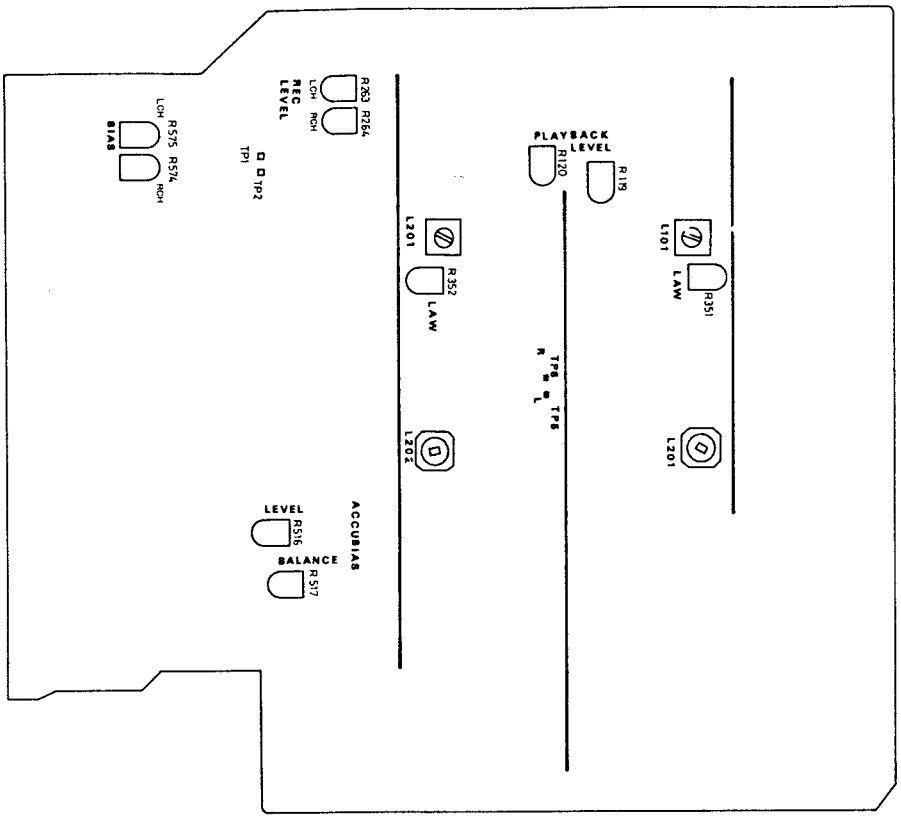


Fig. 16 Playback and record amplifier pc board-adjustment points

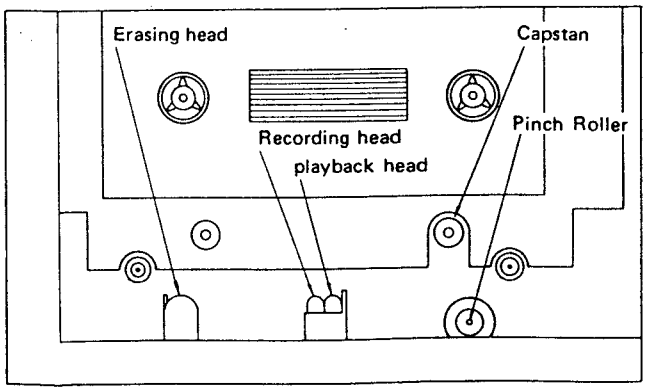
SERVICE PROCEDURES

1. Head cleaning

A dirty head will cause:

- Poor sound quality (loss of high sounds)
- Decreased volume
- Skipping
- Poor erasing (incomplete erasure of previous recording)

To prevent these problems, clean the heads and capstan shaft with a cleaning pen or cotton swab dipped in a little alcohol.



2. Pinch roller cleaning

If the pinch roller is dirty, the tape may become tangled and damaged by wrapping around the roller. Clean the pinch roller when cleaning the head. Use a special cleaner and cotton swab. Head cleaning materials must never be used for the pinch roller.

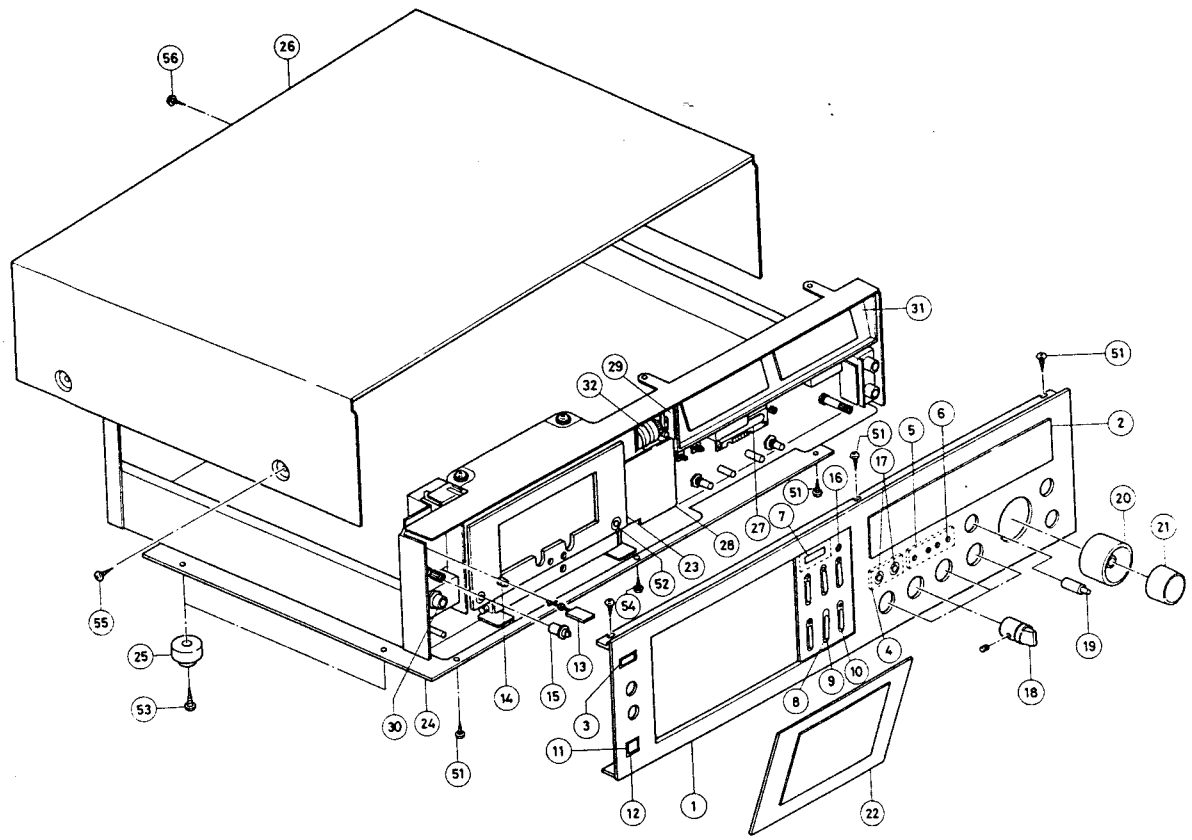
3. Demagnetizing

Residual magnetism builds up in the head after the cassette deck has been used for a long period of time. This build-up introduces noise and static into recording tapes and lowers the high frequency range. To prevent this, demagnetize the recording/playback head, as well as other affected metal parts (like the capstan shaft) once every 50 hours of use. Keep the tape deck power OFF while using the demagnetizer. Also place tapes far away from the work area.

4. DOLBY HX effect measurement

1) Connect the test equipment as shown in Fig. 9.
2) Insert the blank normal tape in the cassette holder.
3) Turn the tape selector switch to the normal position.
4) Apply to 10 kHz, 0VU signal to the line-in terminal and record on the tape.
5) Turn the monitor switch to the tape position.
6) While recording the 10 kHz signal, read the output level with the Dolby switch at OUT and Dolby HX positions.
7) The output level in the Dolby HX position should be more than 7 dB than the out position.
8) Insert the blank chrome tape and turn to the high position.
9) Repeat the above procedures (step 4 to step 6).
10) The output level in the Dolby HX position should be more than 5 dB than the out position.

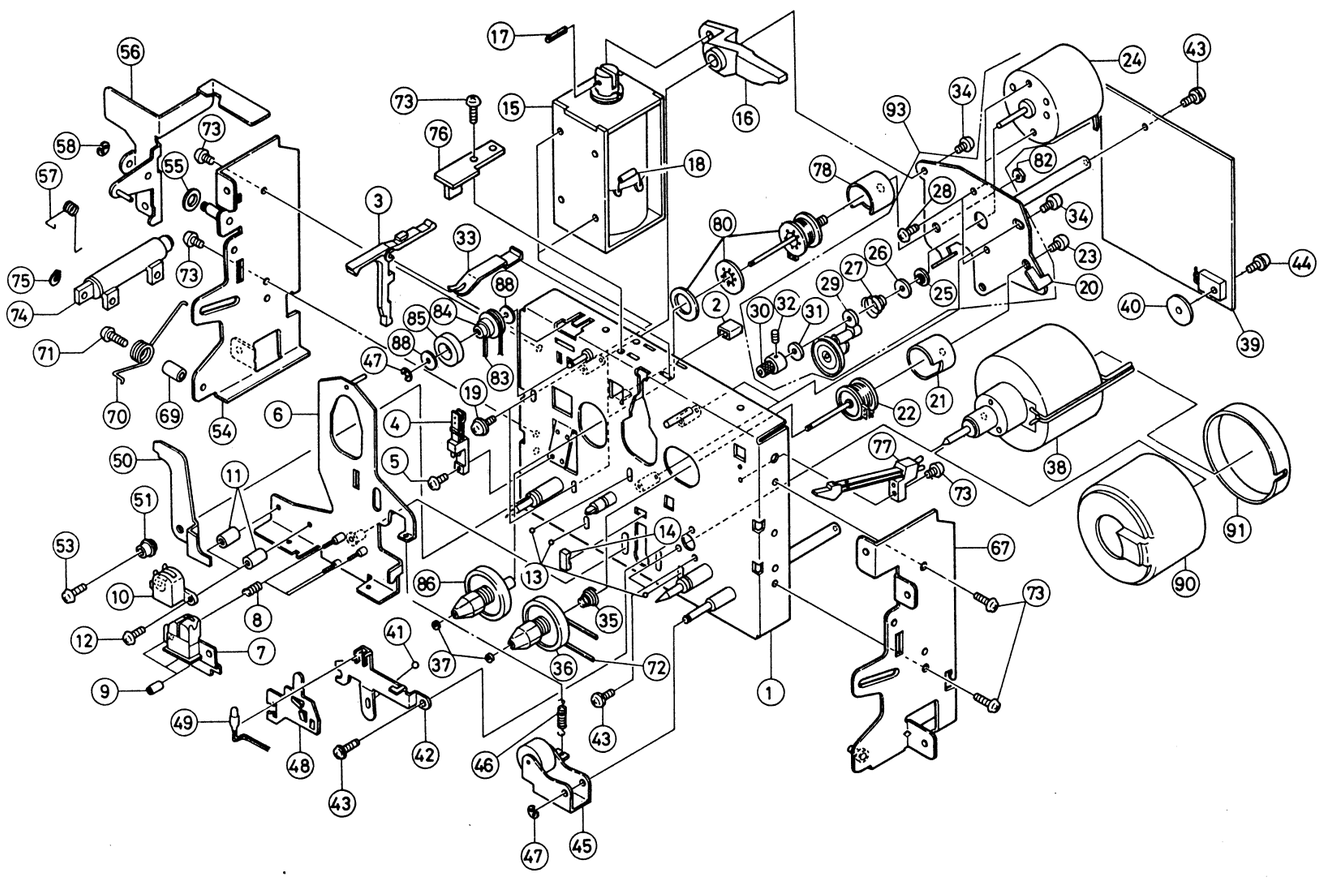
EXPLODED VIEW

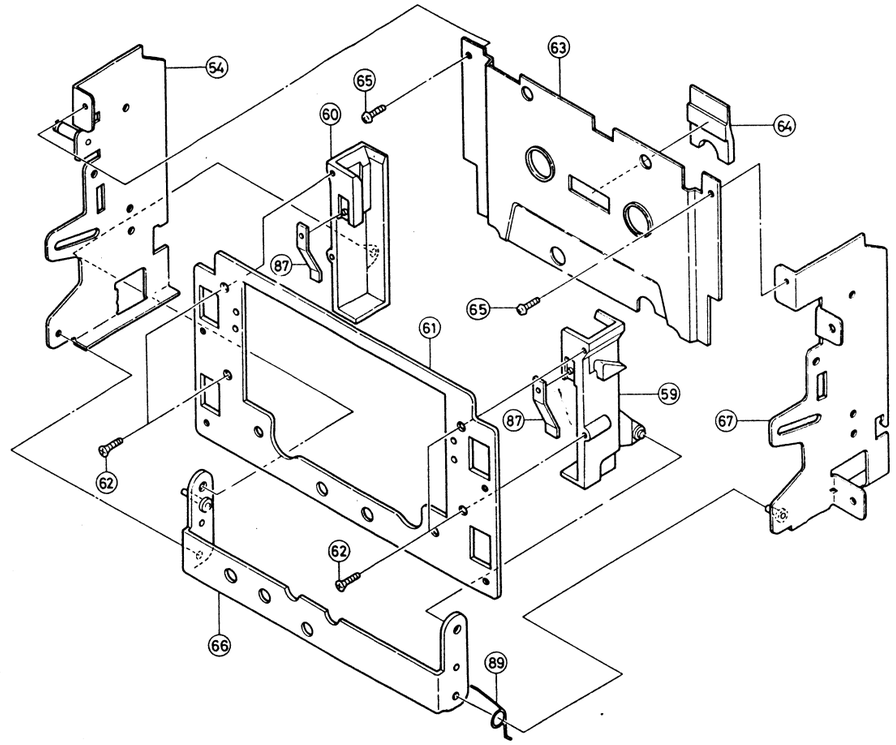


EXPLODED VIEW-PARTS LIST

REF. NO.	PARTS NO.	DESCRIPTION
1	16299121	Front panel ass'y (1-8)
2	28191065	Clear plate
3	27267061	Guide, eject
4	27267076	Guide, push
5	27267077	Guide, indicator
6	28198534	Facet
7	27300148	Window, counter
8	27267075	Guide
9	28320450	Knob, push
10	28320451	Knob, record
11	27267048	Guide, power
	16299902	Power knob ass'y
12	28320470	Knob, power
	27180038	Spring
13	28320453	Knob, eject
14	27180021	Spring
15	28320454	Knob, timer/memory
16	28320455	Knob, counter
17	28320456	Knob, push
18	28320469	Knob, selector
19	28320458	Knob, output
20	28320393	Knob, left
21	28320459	Knob, right
22	16299901	Cassette lid ass'y
23	28400005	Cassette holder
24	27170087	Bottom board
25	27175009	Leg
26	28184093	Top cover
27	16299543	NAPL-943, Lamp p.c.b.
28	16299547	NASW-947, Operation key p.c.b.
29	16299549	NAPL-949, Meter illumination lamp p.c.b.
30	25045077	HLJ0605-01-020, Stereo headphone jack
31	27300329	Meter frame
32	24601075	Counter
51	838130062	3STS+6BQ, Tapping screw
52	82522004	2B+4FN(Ni), Tapping screw
53	831130102	3STW+10BQ, Tapping screw
54	831130082	3STW+8BQ, Tapping screw
55	838440109	4TTB+10C(BC), Tap screw
56	834430102	3STS+10BQ(BC), Tapping screw

MECHANISM-EXPLODED VIEW





REF. NO.	PARTS NO.	DESCRIPTION
1	24610491	Chassis ass'y
2	24610376	Rubber, brake
3	24603130	Lever, chrome tape detector
4	24603128	Leaf switch, record preventing
5	82112004	M2x4, Pan head machine screw
6	24610492	Chassis, head
7	24600024	Head, record and playback
8	24605243	Spring
9	24610495	Nut, head azimuth
10	24600025	Erase head
11	24610493	Spacer
12	82512012	Bind screw
13	24610351	Steelball
14	24610350	Stopper
15	24606098	Solenoid
16	24603131	Lever, head
17	24610369	Pin, spring
18	223848	GP-08B, Diode
19	801220	M3x6, Pan head screw with spring washer
20	24610372	Bracket, motor
21	24610371	Case, reel platform
22	24610494	Bobbin ass'y

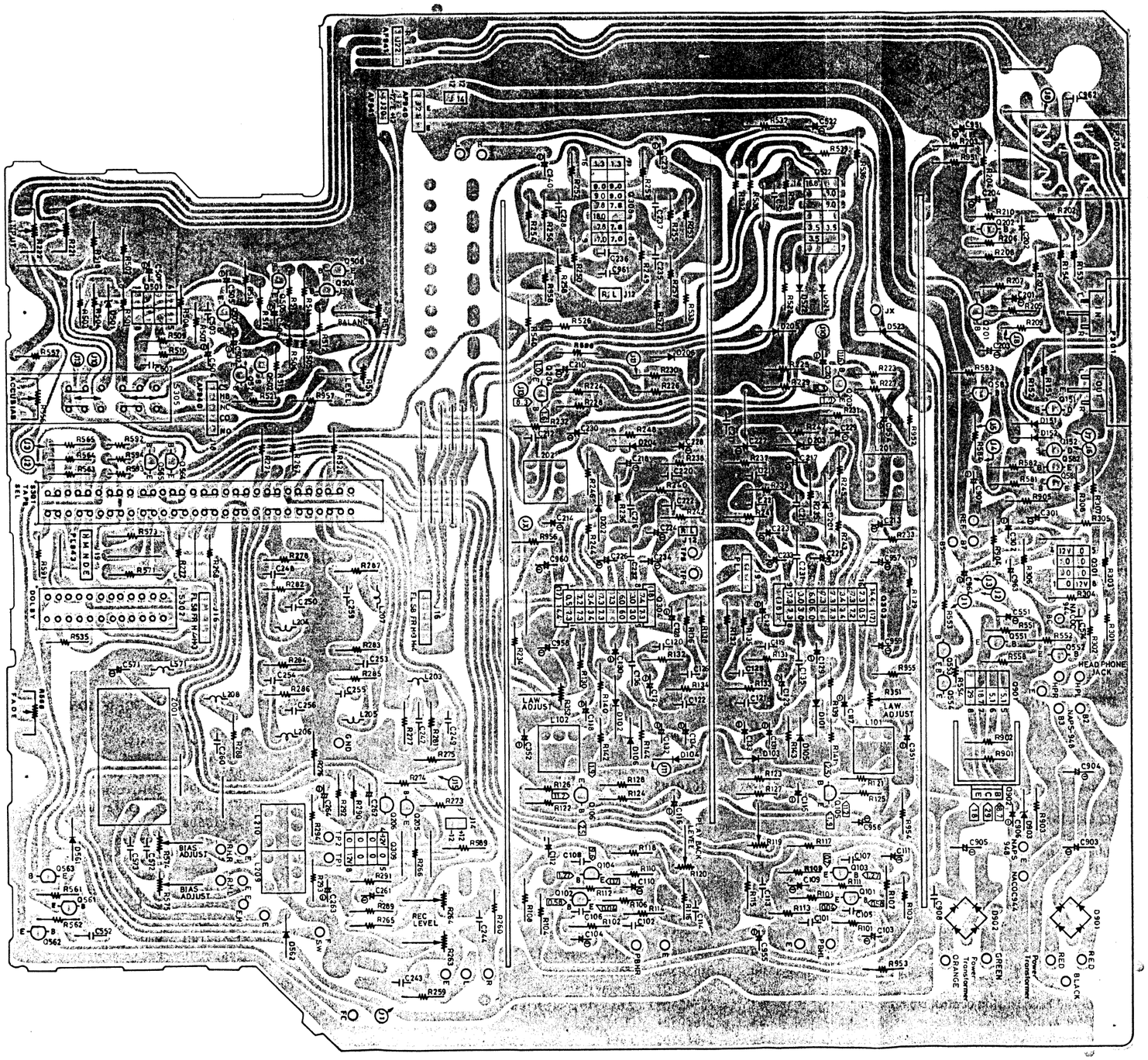
REF. NO.	PARTS NO.	DESCRIPTION
23	82512304	M2.3x4, Bind screw
24	24601054	Reel motor
25	24610373	Catcher, spring
26	24610374	Washer
27	24605194	Spring
28	82512603	M2.6x3, Bind screw
29	24602076	Lever, idler
30	24601052	Pulley, motor
31	24610375	Felt
32	801221	Screw
33	24605183	Spring, cassette holding
34	801176	Pan head screw
35	24605193	Spring
36	24602098	Take-up reel
37	24610349	Washer
38	24601055	Capstan motor
39	24606106	Motor and back tension control p.c.b.
40	24610377	Insulator washer
41	24610279	3ϕ, steelball
42	24610496	Plate, head pressure
43	801181	M2.6x6, Pan head screw
44	801178	M2.6x8, Pan head screw

REF. NO.	PARTS NO.	DESCRIPTION
45	24610497	Pinch arm ass'y
46	24605244	Spring
47	8930201	Circlip
48	24610498	Holder, lamp
49	24606107	50mA, 8V, Lamp
50	24610345	Lock plate
51	24610344	Collar
53	833125089	2.5x8, Pan head screw
54	24610499	Bracket, side
55	24610452	Washer
56	24610500	Lever, canceller
57	24605245	Spring
58	8930302	E3, Circlip
59	24610501	Holder, cassette
60	24610502	Holder, cassette
61	24610503	Mount plate
62	835426082	2.6x8, Tapping screw
63	24610504	Plate
64	24610505	Tube
65	833225059	Screw
66	24610506	Bracket ass'y, cassette holder
67	24610507	Bracket, side

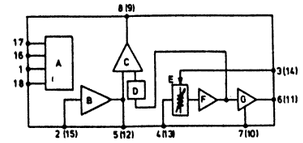
REF. NO.	PARTS NO.	DESCRIPTION
69	24610516	Spacer
70	24605246	Spring
71	833130129	3x12, Pan head screw
72	24602099	Belt, counter
73	833125059	2.5x5, Pan head screw
74	24610508	Damper
75	24610514	Clip link
76	24606105	Hall IC p.c.b.
77	24606104	Leaf switch
78	24610509	Case, reel platform
80	24610519	Brake ass'y
82	863730	M3, Nut
83	24602100	Belt
84	24602101	Pulley
85	24610512	Magnet
86	24602102	Reel, supply
87	24605188	Spring
88	24610515	ϕ2.5, washer
89	24605247	Spring
90	24610517	Cap
91	24610518	Cap
93	24601056	Reel motor/Idler ass'y (20,24~32)

REC. AND PLAYBACK AMPLIFIER PC BOARD VIEW FROM BOTTOM SIDE

220V model

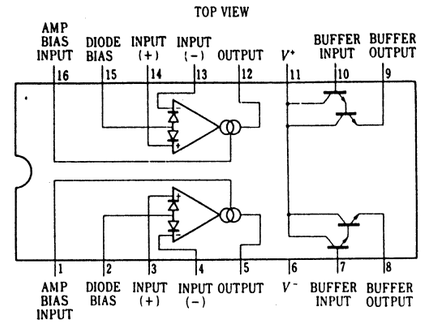


HA-11226 BLOCK DIAGRAM

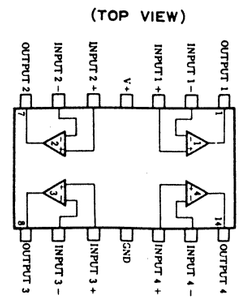


A : POWER SUPPLY
B : INPUT AMP
C : ADDER
D : OVER SHOOT SUPPRESSION
E : VARY RESISTANCE
F : SIDE CHAIN ANP
G : RECTIFIER AMP

LM13600N BLOCK DIAGRAM



LM324N BLOCK DIAGRAM

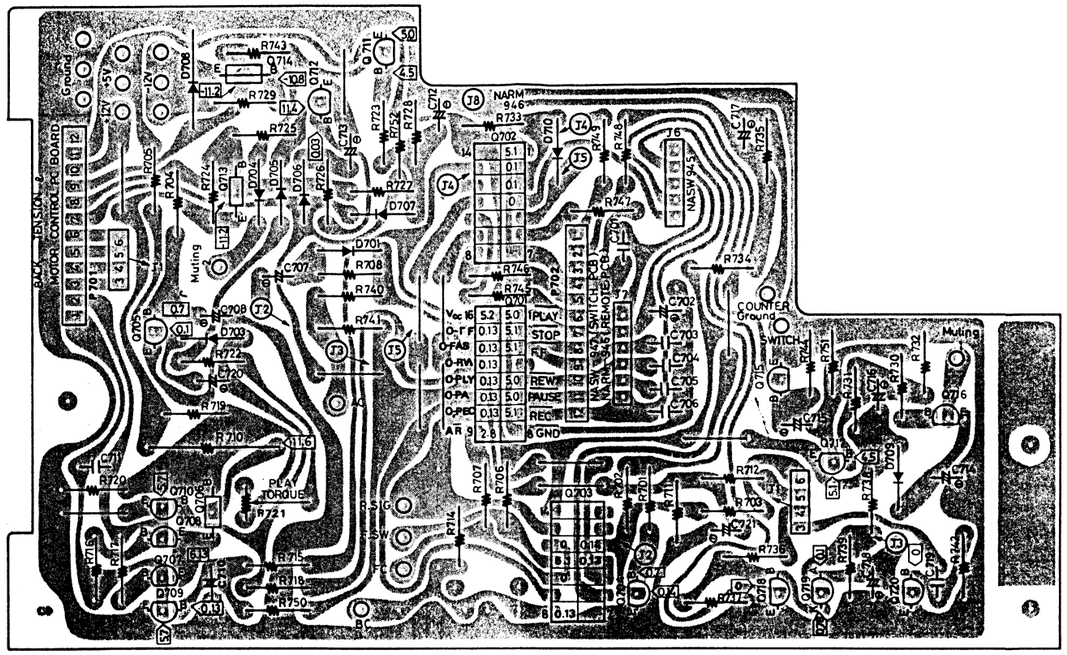


RECORD AND PLAYBACK AMPLIFIER PC BOARD (NAAF-939a) – PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	ICs	
Q301	222603	μPC4557C
Q303, Q304	222460	HA-11226
Q308	222602 or	LM13600N or
	222617	NE5517N
Q309, Q501	222465	NJM4558D
Q522	222604	LM324N
Q901	222465	NJM4558D
	Transistors	
Q101–Q104	2211406	2SC2240(BL)
Q105, Q106	2211255	2SC1815(GR)
Q151, Q152	2210274	2SK30A(Y), F.E.T
Q201, Q202	2211406	2SC2240(BL)
Q203–Q206	2211255	2SC1815(GR)
Q502–Q506	2211255	2SC1815(GR)
Q521	2211255	2SC1815(GR)
Q551, Q561	2211554	2SA562TM(Y)
Q552, Q553	2211255	2SC1815(GR)
Q554	2211683	2SD468(C)
Q562	2211255	2SC1815(GR)
Q563	2211683	2SD468(C)
Q564, Q565	2211255	2SC1815(GR)
Q581–Q583	2211255	2SC1815(GR)
Q902	2201074	2SD880(Y)
	Diodes	
D101, D102	223103 or	1N60 or
	223132	1K60
D103–D106	223105 or	1S1555 or
D151, D152	223133	DS-442X
D201, D202	223103 or	1N60 or
	223132	1K60
D203–D206	223105 or	1S1555 or
	223133	DS-442X
D501	224038 or	05Z5.1L or
	224093	GZA5.1L
D521–D523	223105 or	1S1555 or
	223133	DS-442X
D561, D562	223804 or	SR1K-2 or
	223848	GP08B
D901	223868	2W02
D902	223862	WL-01
D903	224038 or	05Z5.1L or
	224093	GZA5.1L
	Coils	
L101, L102	233146	NCH4021
L201, L202	233221	NMC5021
L203, L204	24606070	NCH-1008
L205, L206	24606069	NCH-1007
L207, L208	24606108	NCH-1048
L209, L210	233186	NCH-3032
L571	233188	NCH-1033
	Oscillator block	
Z001	24606103	NOB-011
	Capacitors	
C103, C104	392850337	3.3μF, 25V, LL
C109, C110	352732209	22μF, 10V, Elect.
C111, C112	352750479	4.7μF, 25V, Elect.
C113, C114	379128224	8,200pF±5%, 50V, DEW
C115, C116	392850477	4.7μF, 25V, LL
C117, C118	352741009	10μF, 16V, Elect.
C119, C120	384124723	4,700pF±2%, 50V, DT
C121, C122	384121533	15,000pF±2%, 50V, DT
C123, C124	392883397	0.33μF, 50V, LL
C125, C126	384121533	15,000pF±2%, 50V, DT
C127–C130	352741009	10μF, 16V, Elect.
C131, C132	392881097	0.1μF, 50V, LL
C133, C134	392883397	0.33μF, 50V, LL
C135, C136	384121044	0.1μF±5%, 50V, DT
C201, C202	392880107	1μF, 50V, LL
C203, C204	352780109	1μF, 50V, Elect.
C209, C210	392850477	4.7μF, 25V, LL
C213, C214	352741009	10μF, 16V, Elect.
C215, C216	384124723	4,700pF±2%, 50V, DT
C217, C218	392883397	0.33μF, 50V, LL
C219–C222	384121533	15,000pF±2%, 50V, DT
C223, C224	352741009	10μF, 16V, Elect.
C225, C226	352741009	10μF, 16V, Elect.

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Capacitors	
C227, C228	392881097	0.1μF, 50V, LL
C229, C230	392883397	0.33μF, 50V, LL
C231, C232	384121044	0.1μF±2%, 50V, DT
C233, C234	352780229	2.2μF, 50V, Elect.
C237, C238	379121524	1,500pF±5%, 50V, DEW
C239, C240	352741009	10μF, 16V, Elect.
C243, C244	379121824	1,800pF±5%, 50V, DEW
C249, C250	379121234	12,000pF±5%, 50V, DEW
C255, C256	379121234	12,000pF±5%, 50V, DEW
C259, C260	379121034	10,000pF±5%, 50V, DEW
C261, C262	352781099	0.1μF, 50V, Elect.
C263, C264	352781009	10μF, 50V, Elect.
C301, C302	352741009	10μF, 16V, Elect.
C351, C352	352741009	10μF, 16V, Elect.
C501	352741009	10μF, 16V, Elect.
C502	352784799	0.47μF, 50V, Elect.
C503	379121234	0.012μF±5%, 50V, DEW
C504	352784799	0.47μF, 50V, Elect.
C505	352780109	1μF, 50V, Elect.
C506	352781099	0.1μF, 50V, Elect.
C522	352741009	10μF, 16V, Elect.
C551	352722219	220μF, 6.3V, Elect.
C552	379124734	0.047μF±20%, 50V, DEW
C571	352781099	0.1μF, 50V, Elect.
C903, C904	352752229	2,200μF, 25V, Elect.
C905	352761029	1,000μF, 35V, Elect.
C906	352780109	1μF, 50V, Elect.
C907, C951	352741009	10μF, 16V, Elect.
C954, C956	352752219	220μF, 25V, Elect.
C955	352751019	100μF, 25V, Elect.
C957, C958	352744719	470μF, 16V, Elect.
C959, C960	352752219	220μF, 25V, Elect.
C963, C964	352741009	10μF, 16V, Elect.
	Resistors	
R119, R120	5215023	N08HR50KBC, Semi-fixed
R221, R222	5104106	N16RKL50KA40F, Variable
R263, R264	5215020	N08HR5KBC, Semi-fixed
R351, R352	5215021	N08HR10KBC, Semi-fixed
R516, R517	5215019	N08HR2KBC, Semi-fixed
R556	5104105	N16RLS10KB20M, Variable
R566	5104107	N16RLS5K20M, Variable
R571	441521514	150Ω, ½W, Metal oxide film
R573	441523314	330Ω, ½W, Metal oxide film
R574, R575	5215023	N08HR50KBC, Semi-fixed
	Switches	
S301	25030174	NRSM-1103-20SS, Tape selector
S302	25030173	NRSM-144-20SS, Dolby NR
	Terminal	
P301	25045020	NPJ-4PDBL11, Tape input/output
	Socket	
P302	25050064	NSCT5P18, DIN
	Radiator	
	27160029	
	Lead wires	
J9	79119	JL-4-290-5-5-P2.5
J16	79124	JL-5-110-5-5-P2.5
J18	79120	JL-5-140-5-5-P2.5
J21	79118	JL-4-160-5-5-P2.5
J22	79122	JL-4-145-5-5-P2.5
	Screws	
	831130082	3STW+8BQ, Tapping
	82113006	3P+6FN, Pan head
	Plates	
	27300130	Ground
	28175032	Insulator

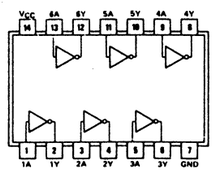
CONTROL CIRCUIT PC BOARD VIEW FROM BOTTOM SIDE



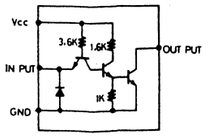
CONTROL PC BOARD (NACOC-944) – PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	ICs	
Q701	222555	M54410P
Q702, Q703	222556	HD7405P or F7405
	Transistors	
Q704, Q705	2211255	2SC1815(GR)
Q706	2201060	2SD549
Q707, Q708	2211554	2SA562TM(Y)
Q709, Q710	2211706	2SD655(F)
Q711	2211454	2SA1015(Y)
Q712	2211255	2SC1815(GR)
Q713	2201275 or	2SB772(Q) or
	2201276	2SB772(R)
Q714	2211612 or	2SD471(L) or
	2211611	2SD471(K)
Q715	2211255	2SC1815(GR)
Q716, Q717	2211454	2SA1015(Y)
Q718, Q720	2211255	2SC1815(GR)
Q719	2211571	TN41A, F.E.T
	Diodes	
D701, D703	223105 or	1S1555 or
D704–D707	223133	DS-442X
D708	223804 or	SR1K-2 or
	223848	GP08B
D709, D710	223105 or	1S1555 or
	223133	DS-442X

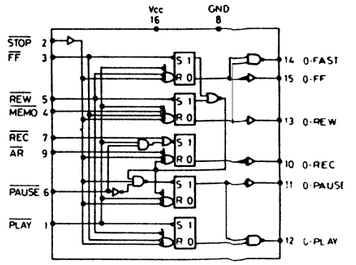
CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Capacitors	
C702	352784799	0.47μF, 50V, Elect.
C707	352750479	4.7μF, 25V, Elect.
C708	352780229	2.2μF, 50V, Elect.
C710	352724709	47μF, 6.3V, Elect.
C712	352732209	22μF, 10V, Elect.
C713	352784799	0.47μF, 50V, Elect.
C714	352724719	470μF, 6.3V, Elect.
C715	352723309	33μF, 6.3V, Elect.
C716	352722219	220μF, 6.3V, Elect.
C717	352731009	10μF, 10V, Elect.
C718	352732209	22μF, 10V, Elect.
C720	352731009	10μF, 10V, Elect.
C721	352724709	47μF, 6.3V, Elect.
	Resistors	
R710	442722704	27Ω, 2W, Metal oxide film
R721	5215020	N08HR5KBC, Semi-fixed
	Plugs	
P701, P702	25065133	NPLG-12P-18
	Lead wires	
J1	79118	JL4-160-5-5-P2.5
J6	79120	JL5-220-5-5-P2.5



HD7405, F7405



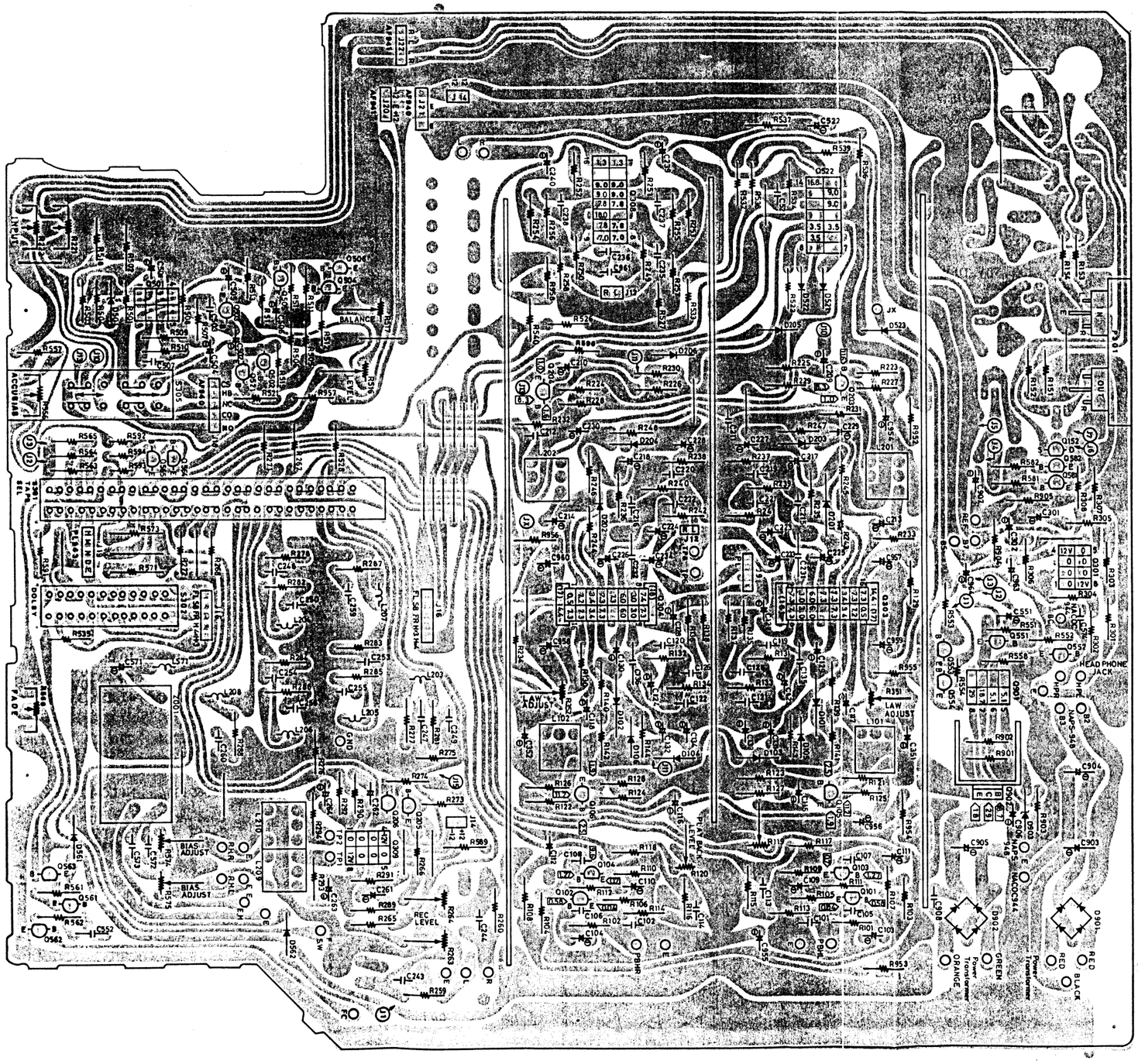
7405
SCHEMATIC DIAGRAM
(ONE CIRCUIT SHOWN)



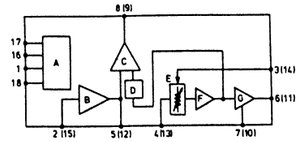
M 54410P BLOCK DIAGRAM

REC. AND PLAYBACK AMPLIFIER PC BOARD VIEW FROM BOTTOM SIDE

120V model

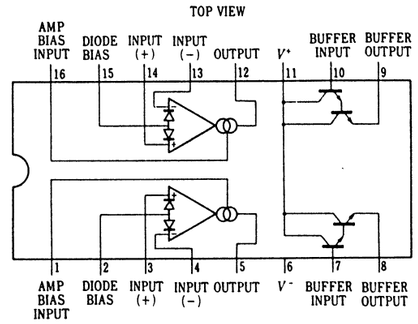


HA-11226 BLOCK DIAGRAM

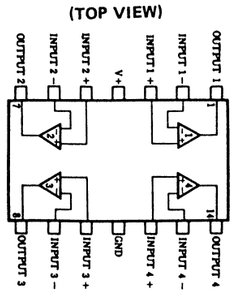


A : POWER SUPPLY
B : INPUT AMP
C : ADDER
D : OVER SHOOT SUPPRESSION
E : VARY RESISTANCE
F : SIDE CHAIN ANP
G : RECTIFIER AMP

LM13600N BLOCK DIAGRAM



LM324N BLOCK DIAGRAM

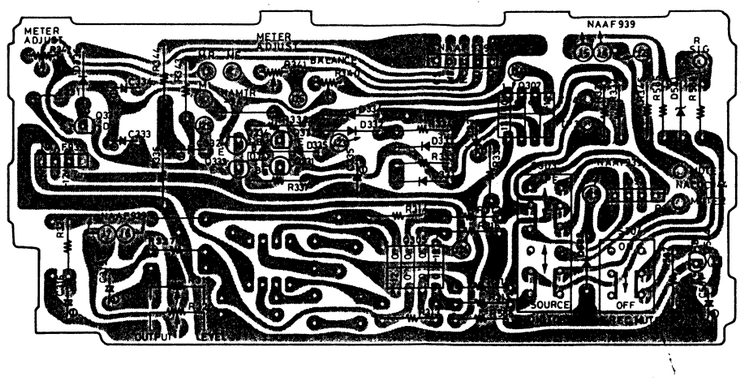


RECORD AND PLAYBACK AMPLIFIER PC BOARD (NAAF-939) – PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	ICs	
Q301	222603	μPC4557C
Q303, Q304	222460	HA-11226
Q308	222602 or	LM13600N or
	222617	NE5517N
Q309, Q501	222465	NJM4558D
Q522	222604	LM324N
Q901	222465	NJM4558D
	Transistors	
Q101–Q104	2211406	2SC2240(BL)
Q105, Q106	2211255	2SC1815(GR)
Q203–Q206	2211255	2SC1815(GR)
Q502–Q506	2211255	2SC1815(GR)
Q521	2211255	2SC1815(GR)
Q551, Q561	2211554	2SA562TM(Y)
Q552, Q553	2211255	2SC1815(GR)
Q554	2211683	2SD468(C)
Q562	2211255	2SC1815(GR)
Q563	2211683	2SD468(C)
Q564, Q565	2211255	2SC1815(GR)
Q581, Q582	2211255	2SC1815(GR)
Q902	2201074	2SD880(Y)
	Diodes	
D101, D102	223103 or	1N60 or
	223132	1K60
D103–D106	223105 or	1S1555 or
	223133	DS-442X
D201, D202	223103 or	1N60 or
	223132	1K60
D203–D206	223105 or	1S1555 or
	223133	DS-442X
D501	224038 or	05Z5.1L or
	224093	GZA5.1L
D521–D523	223105 or	1S1555 or
	223133	DS-442X
D561, D562	223804 or	SR1K-2 or
	223848	GP08B
D901	223868	2W02
D902	223862	WL-01
D903	224038 or	05Z5.1L or
	224093	GZA5.1L
	Coils	
L101, L102	233146	NCH4021
L201, L202	233221	NMC5021
L203, L204	24606070	NCH-1008
L205, L206	24606069	NCH-1007
L207, L208	24606108	NCH-1048
L209, L210	233186	NCH-3032
L571	233188	NCH-1033
	Oscillator block	
Z001	24606103	NOB-011
	Capacitors	
C103, C104	392850337	3.3μF, 25V, LL
C109, C110	352732209	22μF, 10V, Elect.
C111, C112	352750479	4.7μF, 25V, Elect.
C113, C114	379128224	8,200pF±5%, 50V, DEW
C115, C116	392850477	4.7μF, 25V, LL
C117, C118	352741009	10μF, 16V, Elect.
C119, C120	384124723	4.700pF±2%, 50V, DT
C121, C122	384121533	15,000pF±2%, 50V, DT
C123, C124	392883397	0.33μF, 50V, LL
C125, C126	384121533	15,000pF±2%, 50V, DT
C127–C130	352741009	10μF, 16V, Elect.
C131, C132	392881097	0.1μF, 50V, LL
C133, C134	392883397	0.33μF, 50V, LL
C135, C136	384121044	0.1μF±5%, 50V, DT
C209, C210	392850477	4.7μF, 25V, LL
C213, C214	352741009	10μF, 16V, Elect.
C215, C216	384124723	4,700pF±2%, 50V, DT
C217, C218	392883397	0.33μF, 50V, LL
C219–C222	384121533	15,000pF±3%, 50V, DT
C223, C224	352741009	10μF, 16V, Elect.
C225, C226	352741009	10μF, 16V, Elect.
C227, C228	392881097	0.1μF, 50V, LL
C229, C230	392883397	0.33μF, 50V, LL
C231, C232	384121044	0.1μF±2%, 50V, DT
C233, C234	352780229	2.2μF, 50V, Elect.

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Capacitors	
C237, C238	379121524	1,500pF±5%, 20V, DEW
C239, C240	352741009	10μF, 16V, Elect.
C243, C244	379121824	1,800pF±5%, 50V, DEW
C249, C250	379121234	12,000pF±5%, 50V, DEW
C255, C256	379121234	12,000pF±5%, 50V, DEW
C259, C260	379121034	10,000pF±5%, 50V, DEW
C261, C262	352781099	0.1μF, 50V, Elect.
C263, C264	352781009	10μF, 50V, Elect.
C301, C302	352741009	10μF, 16V, Elect.
C351, C352	352741009	10μF, 16V, Elect.
C501	352741009	10μF, 16V, Elect.
C502	352784799	0.47μF, 50V, Elect.
C503	379121234	0.012μF±5%, 50V, DEW
C504	352784799	0.47μF, 50V, Elect.
C505	352780109	1μF, 50V, Elect.
C506	352781099	0.1μF, 50V, Elect.
C522	352741009	10μF, 16V, Elect.
C551	352722219	220μF, 6.3V, Elect.
C552	379124734	0.047μF±20%, 50V, DEW
C571	352781099	0.1μF, 50V, Elect.
C903, C904	352752229	2,200μF, 25V, Elect.
C905	352761029	1,000μF, 35V, Elect.
C906	352780109	1μF, 50V, Elect.
C907	352741009	10μF, 16V, Elect.
C954, C956	352752219	220μF, 25V, Elect.
C955	352751019	100μF, 25V, Elect.
C957, C958	352744719	470μF, 16V, Elect.
C959, C960	352752219	220μF, 25V, Elect.
C963, C964	352741009	10μF, 16V, Elect.
	Resistors	
R119, R120	5215023	N08HR50KBC, Semi-fixed
R221, R222	5104106	N16RKL50KA40F, Variable
R263, R264	5215020	N08HR5KBC, Semi-fixed
R351, R352	5215021	N08HR10KBC, Semi-fixed
R516, R517	5215019	N08HR2KBC, Semi-fixed
R556	5104105	N16RLS10KB20M, Variable
R566	5104107	N16RLS5K20M, Variable
R571	441521514	150Ω, ½W, Metal oxide film
R573	441523314	330Ω, ½W, Metal oxide film
R574, R575	5215023	N08HR50KBC, Semi-fixed
	Switches	
S301	25030174	NRSM-1103-20SS, Tape selector
S302	25030173	NRSM-144-20SS, Dolby NR
	Terminal	
P301	25045020	NPJ-4PDBL11, Tape input/output
	Radiator	
	27160029	
	Lead wires	
J9	79119	JL4-290-5-5-P2.5
J16	79124	JL5-110-5-5-P2.5
J18	79120	JL5-140-5-5-P2.5
J21	79118	JL4-160-5-5-P2.5
J22	79122	JL4-145-5-5-P2.5
	Screws	
	831130082	3STW+8BQ, Tapping
	82113006	3P+6FN, Pan head
	Plates	
	27300130	Ground
	28175032	Insulator

LINE AMPLIFIER PC BOARD VIEW FROM BOTTOM SIDE



LINE AMPLIFIER AND METER DRIVE CIRCUIT PC BOARD (NAAF-940) – PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	IC	
Q305, Q307	222465	NJM-4558D
	Transistors	
Q331–Q334	2211255	2SC1815(GR)
Q335	2210274	2SK30A(Y), F.E.T
Q584	2211255	2SC1815(GR)
	Diodes	
D331–D336	223105 or	1S1555 or
D582	223133	DS-442X
D581	224059 or	05Z13U or (Only G model)
	224114	GZA13U
	Capacitors	
C315, C316	352741009	10μF, 16V, Elect.
C331, C332	352741009	10μF, 16V, Elect.
C333, C334	352721019	100μF, 6.3V, Elect.
C335	352741019	100μF, 16V, Elect.
C581	352733309	33μF, 10V, Elect.
	Resistors	
R319, R320	5148053	N16RGL10KB15, Output level variable
R340, R342	5215011	N08HR20KBA, Semi-fixed
R341	5215010	N08HR10KBA, Semi-fixed
	Coil	
L331	233188	NCH-1033
	Switches	
S303, S304	25035219	NPS-142-123-LS183, Tape monitor/Rec. mute push

MICROPHONE AMPLIFIER PC BOARD (NAAF-941) – PARTS LIST

	IC	
Q302	222502	NJM-4558DX
	Capacitors	
C205, C206	392883397	0.33μF, 50V, LL
C207, C208	352780109	1μF, 50V, Elect.
C952, C953	352741009	10μF, 16V, Elect.
	Jack	
P303	25045078	HLJ0296-01-010, Microphone

METER PC BOARD (NAMTR-942) – PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	243113	NIND-0850S133, Output meter

TAPE INDICATOR PC BOARD (NAPL-943) – PARTS LIST

	L.E.Ds	
PL706–PL708	225060	SEL1301E, Green, High, Metal & Normal
PL709	225059	SEL1110S, Red, Dolby HX
	Lead wire	
	79129	JL5-250-5-5-P2.5
	Holder	
	27190086	

METER ILLUMINATION LAMP PC BOARD (NAPL-949) – PARTS LIST

	210090	PL14V150mA, Lamp

TIMER/MEMORY SWITCH PC BOARD (NASW-945) – PARTS LIST

D711, D712	223133 or	DS-442X or
	223105	1S1555, Diode
S707	25030171	NRS-225-20SBU, Rotary switch

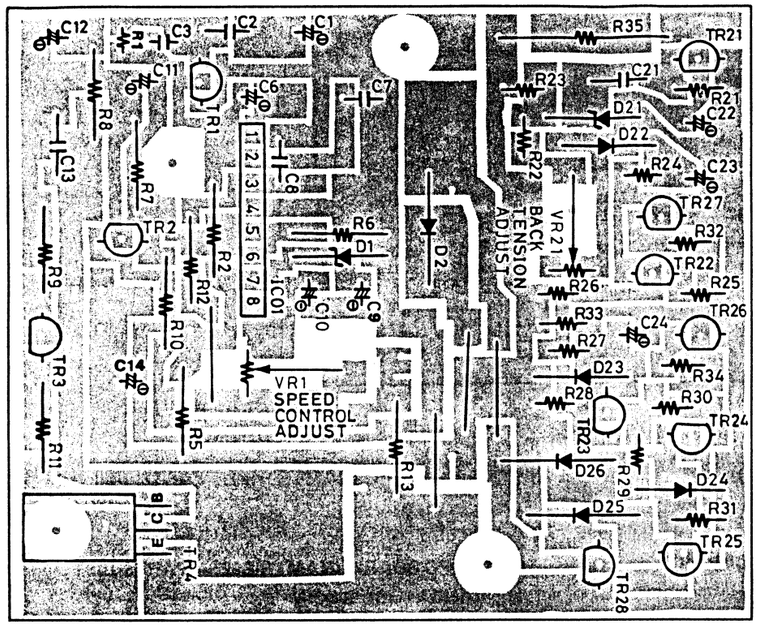
REMOTE TERMINAL PC BOARD (NARM-946) – PARTS LIST

	25050070	NSCT-7P20, DIN socket
	79128	JL6-240-5-5-P2.5, Lead wire

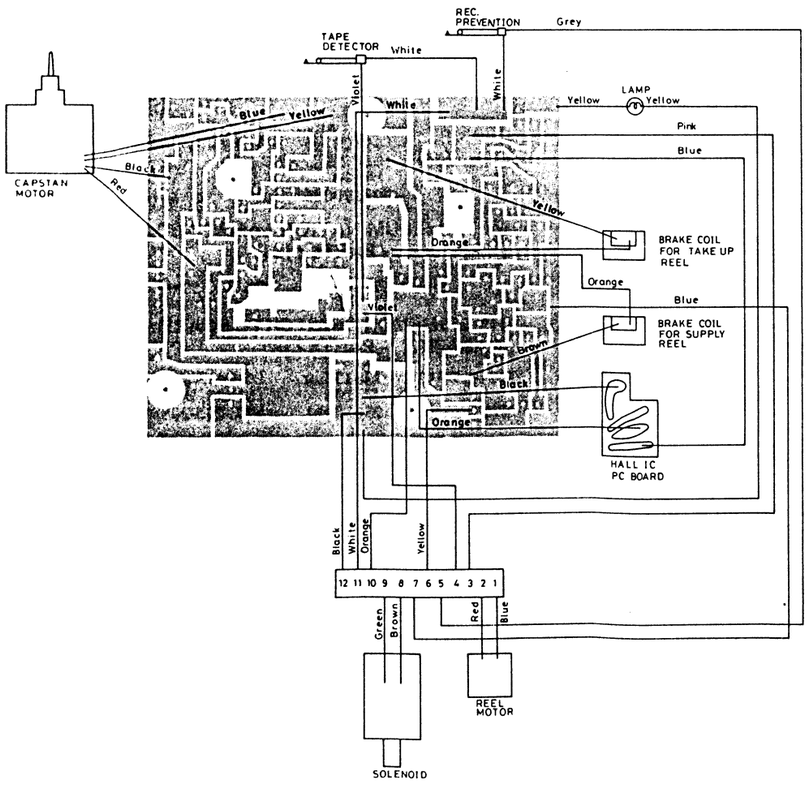
OPERATION KEY PC BOARD (NASW-947) – PARTS LIST

PL701–PL703	2250261	SEL-303G(C), L.E.D, Green
PL704, PL705	2250101	SEL-103R(C), L.E.D. Red
S701– S706	25035089	NPS-111-S54, Push switch
	25050071	NSAS-12P038, Socket
	27190085	Holder (L)

BACK TENSION AND MOTOR CONTROL PC BOARD VIEW FROM BOTTOM SIDE



CONNECTION DIAGRAM FOR MOTOR CONTROL PC BOARD



BACK TENSION AND MOTOR CONTROL PC BOARD – PARTS LIST

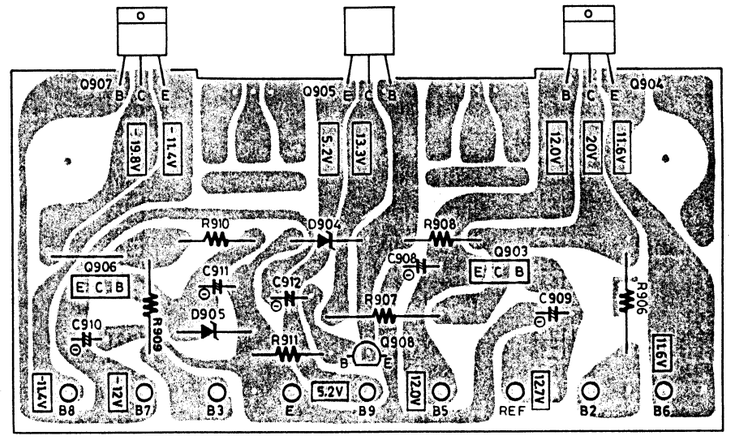
CIRCUIT NO.	PARTS NO.	DESCRIPTION
	IC	
IC1	222620	CX065A
	Transistors	
TR1, TR3	2210730	2SC536(H)
TR2	2212054	2SC2603(D2)
TR4	2212064	2SC1368(D)
TR21, TR22	2210736 or	2SC536(F) or
TR24	2211255	2SC1815(GR)
TR23	2211455	2SA1015(GR) or 2SA1115(F)*
TR25	2211563	2SB562(C)
TR26, TR27	2210736 or	2SC536(F) or
	2211255	2SC1815(GR)
TR28	2211705	2SD655(E)
	Diodes	
D1, D21	223953	RD7.5EB
D2, D25	223804 or	SR1K-2,
D26	223848	GP08B or S5277B*
D22, D23	223105,	1S1555,
	223133 or	DS-442X or
	223137	DS-442Y
D24	223137	DS-442Y
	Capacitors	
C1	352784799	0.47μF, 50V, Elect.
C6	352780109	1μF, 50V, Elect.
C9	352742209	22μF, 16V, Elect.
C10	352741009	10μF, 16V, Elect.
C11, C12	352780229	2.2μF, 50V, Elect.
C14	352744709	47μF, 16V, Elect.
C22, C23	352741009	10μF, 16V, Elect.
C24	352744709	47μF, 16V, Elect.
	Resistors	
R35	441521014	100Ω, ½W, Metal oxide film
VR21	5215023	08HR50KBC, Semi-fixed

Notes: 1. * : There are not the stocks of service part.
2. When broken the VR1, R12 and C8, replace the motor control p.c.b ass'y.

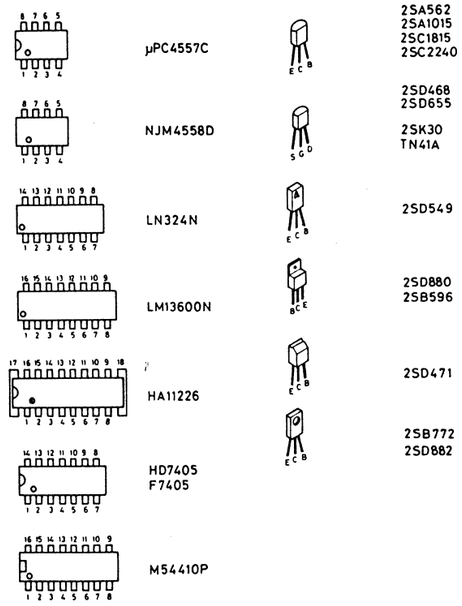
POWER SUPPLY PC BOARD (NAPS-948) –PARTS LIST

	Transistors	
Q903	2201285 or	2SD882(Q) or
	2201286	2SD882(P)
Q904	2201074	2SD880(Y)
Q905	2201285 or	2SD882(Q) or
	2201286	2SD882(P)
Q906	2201275 or	2SB772(Q) or
	2201276	2SB772(P)
Q907	2200413	2SB596(Y)
Q908	2211255 or	2SC1815(GR) or
	2211254	2SC1815(Y)
	Diodes	
D904	224096 or	GZA5.6U or
	224041	05Z5.6U
D905	224112 or	GZA12U or
	224057	05Z12U
	Capacitors	
C908–C910	352741009	10μF, 16V, Elect.
C911	352741019	100μF, 16V, Elect.
C912	352754709	47μF, 25V, Elect.
	Resistors	
R906	451534794	0.47Ω, ½W, Metal
R907	441625604	56Ω, 1W, Metal oxide film
R909	451534794	0.47Ω, ½W, Metal
	Radiator	
	27160046F	
	Screws	
	831130082	3STW+8BQ, Tapping
	82113010	3P+10F'N, Pan head
	Spacer	
	223019	AC-229, for transistor
	Insulator washer	
	223017	AC316A

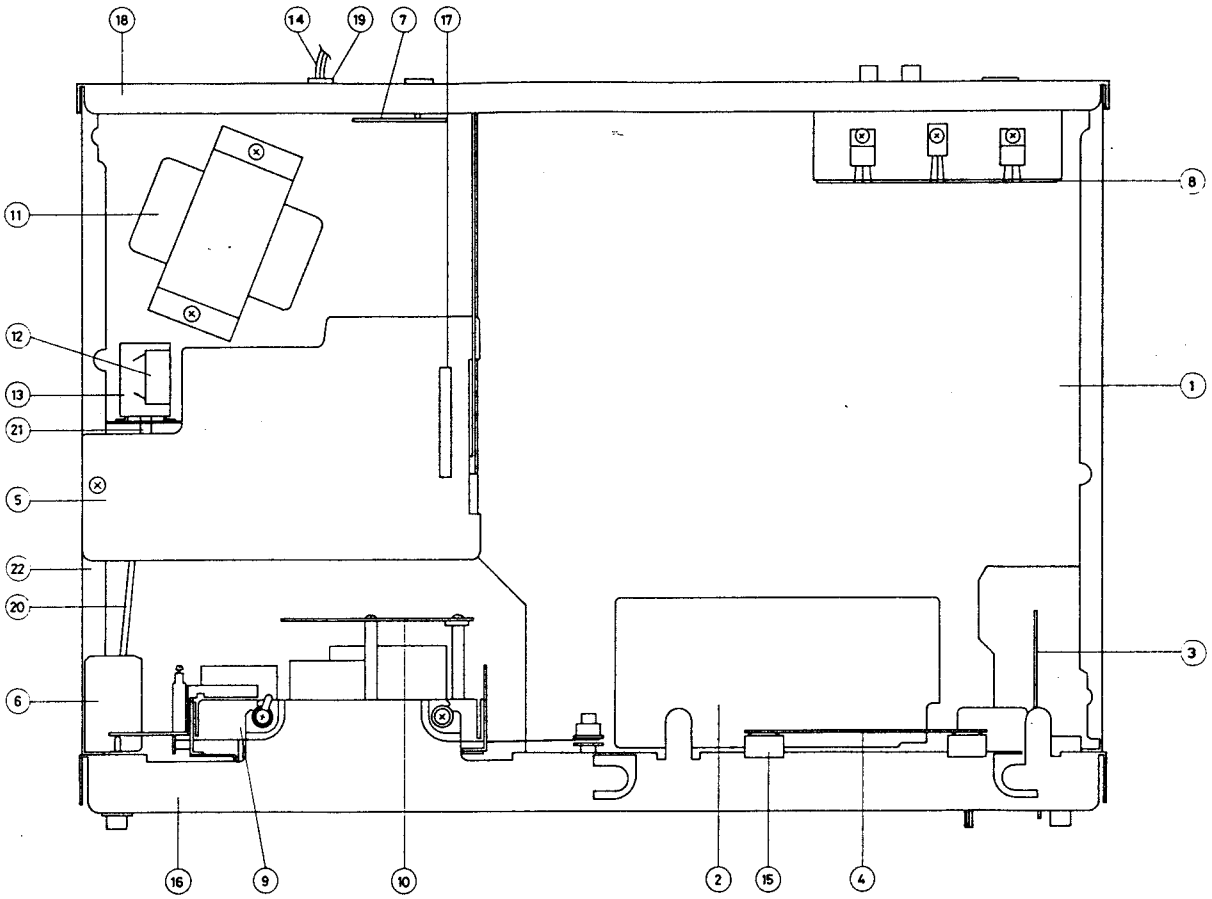
POWER SUPPLY PC BOARD VIEW FROM BOTTOM SIDE



SEMI-CONDUCTOR VIEW



COMPONENT LOCATION



COMPONENT LOCATION – PARTS LIST

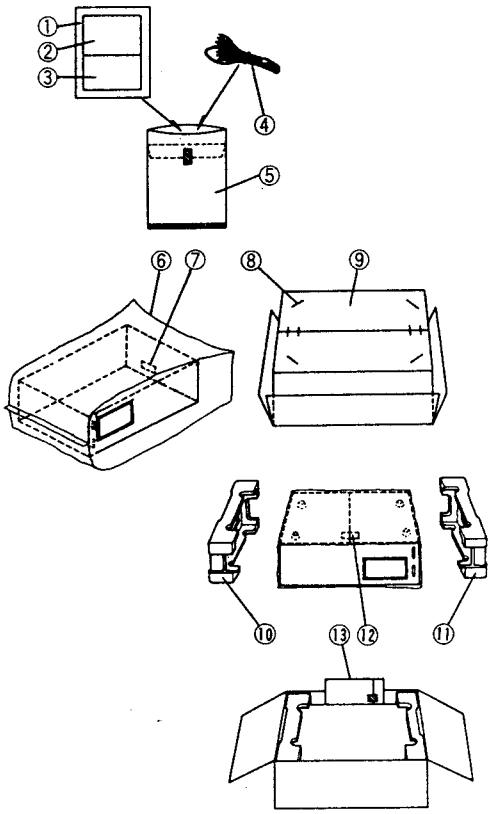
120V model

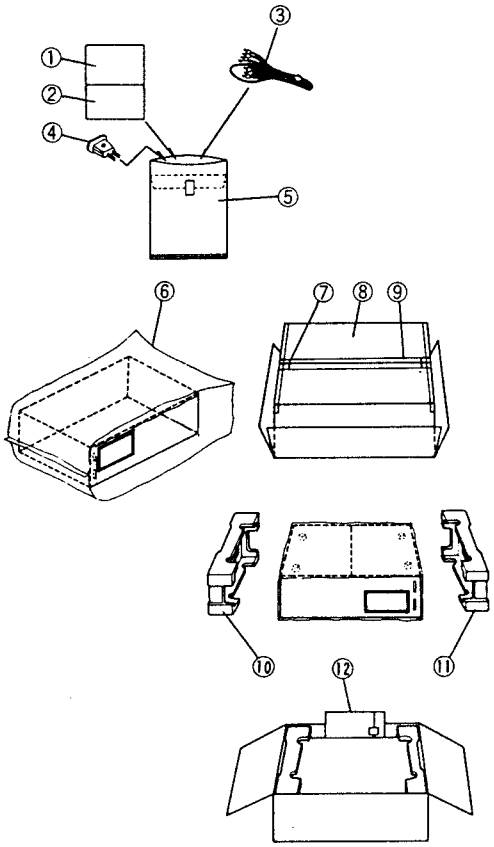
REF. NO.	CIRCUIT NO.	PARTS NO.	DESCRIPTION
1	U1	16299539	NAAF-939, Rec. and playback amplifier p.c.b.
2	U2	16299540B	NAAF-940b, Line amplifier and meter drive circuit p.c.b.
3	U3	16299541	NAAF-941, Microphone amplifier p.c.b.
4	U4	16299542	NAMTR-942, Meter p.c.b.
5	U6	16299544	NACOC-944, Control p.c.b.
6	U7	16299545	NASW-945, Timer/memory p.c.b.
7	U8	16299546	NARM-946, Remote control p.c.b.
8	U10	16299548	NAPS-948, Power supply p.c.b.
9	Z001	244018	NDM-13, Deck mechanism ass'y
10		24606106	Motor and back tension circuit p.c.b.
11	T901	230437	NPT-717D, Power transformer
12	C901	3500057	UL125V, 103M, Capacitor
13		25035224	NPS-121-L188P, Power switch
14		253099A	AS-UC-3, Power supply cord
15		243133	NIND-0850S133, VU meter
16		27110116A	Bracket, front
17		25050069	NSAS-12P037, Socket, 12P
18		27120259	Back panel
19		270025	SR-3P-4, Strainrelief
20		27260040	Shaft, switch
21		28320135	Push knob
22		27115073	Side bracket

220V model

REF. NO.	CIRCUIT NO.	PARTS NO.	DESCRIPTION
1	U1	16302539A	NAAF-939a, Rec. and playback amplifier p.c.b.
2	U2	16302540	NAAF-940, Line amplifier and meter drive circuit p.c.b.
3	U3	16299541	NAAF-941, Microphone amplifier p.c.b.
4	U4	16299542	NAMTR-942, Meter p.c.b.
5	U6	16299544	NACOC-944, Control p.c.b.
6	U7	16299545	NASW-945, Timer/memory p.c.b.
7	U8	16299546	NARM-946, Remote control p.c.b.
8	U10	16299548	NAPS-948, Power supply p.c.b.
9	Z001	244018	NDM-13, Deck mechanism ass'y
10		24606106	Motor and back tension circuit p.c.b.
11	T901	230438	NPT-717G, Power transformer
12	C901	3500058	PME265MB510, 0.01μF, Capacitor
13		25035192	NPS-121-L156P, Power switch
14		253083	AS-CEE, Power supply cord
15		243133	NIND-0850S133, VU meter
16		27110116A	Bracket, front
17		25050069	NSAS-12P037, Socket, 12P
18		27120260	Back panel
19		270280	SR-4K-4, Strainrelief
20		27260040	Shaft, switch
21		28320135	Push knob
22		27115073	Side bracket

PACKING PROCEDURES





120V model

Ref. No.	Parts No.	Description
1	29340456	Instruction manual
2	29358002	Service station list (D)
3	29365006	Warranty card (D)
4	253074	Pin-pin connection cord
5	29100005	330 x 220 mm, Poly bag
6	29100037	650 x 500 mm, Poly bag
7	29360378	Label (D)
8	282301	Sealing hook
9	29050392	Master carton box
10	29090543	Pad (R)
11	29090542A	Pad (L)
12	29360363	Caution label (D)
13		Accessary bag

(D) : Only U.S.A. model

220V model

Ref. No.	Parts No.	Description
1	29340457	Instruction manual
2	29365005-3	Warranty card (G)
3	253074	Pin-pin connection cord
4	25055018	Conversion plug (W)
5	29100005	330 x 220 mm, Poly bag
6	29100037	650 x 500 mm, Poly bag
7	282301	Sealing hook
8	29050392	Master carton box
9	260012	Damplon tape
10	29090543	Pad (R)
11	29090542A	Pad (L)
12		Accessary bag

(G) : Only Germany model
(W): Only 120/220V model

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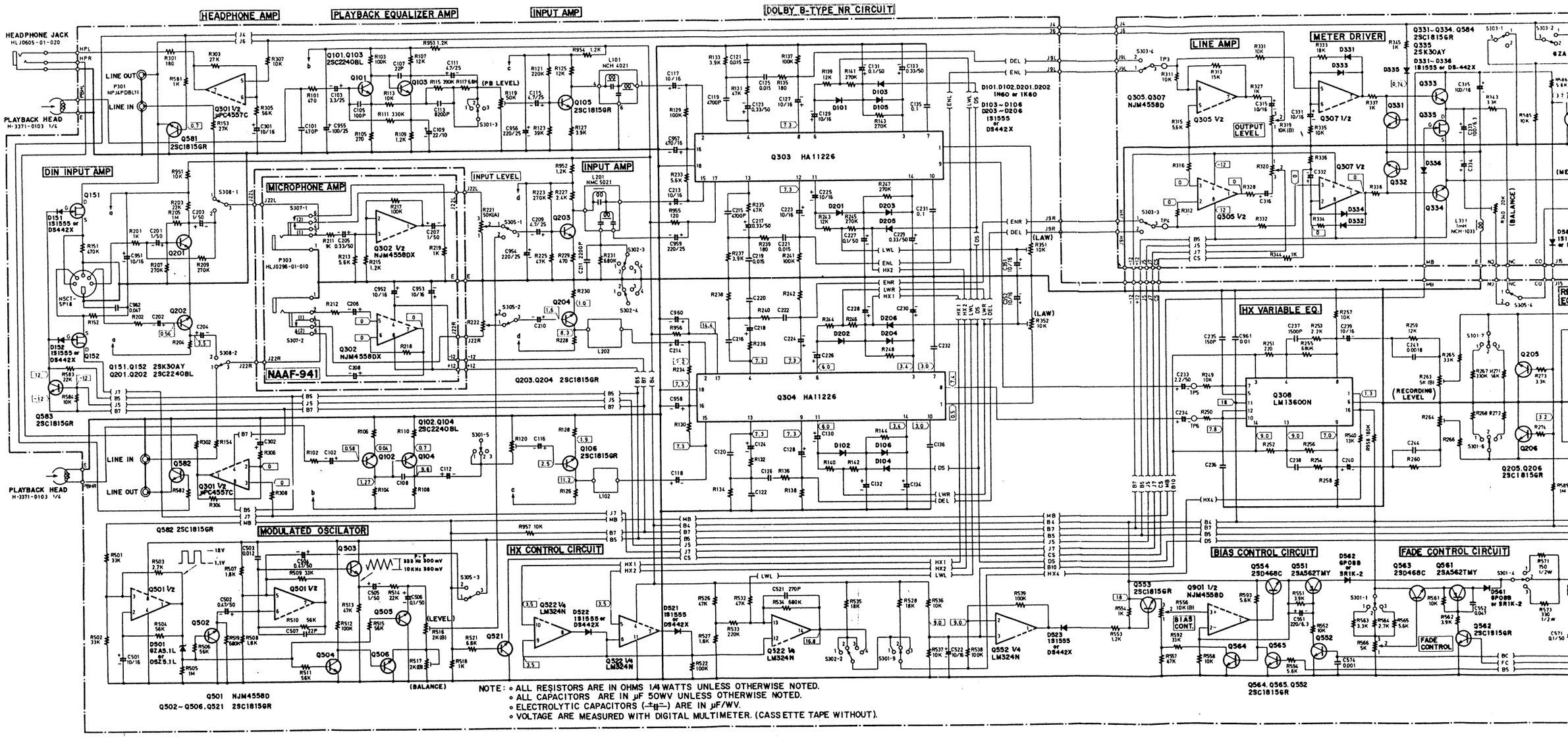
Printed in Japan 1010

SCHEMATIC DIAGRAM

220V model



NAAF-940

NAAF-939

NAMTR-942

NAPL-943

NAPL-949

NAPL-949

NAPS-948

NARM-946

NASW-947

NASW-945

METER DRIVER

LINE AMP

OUTPUT LEVEL

HX VARIABLE EQ.

RECORDING EQUALIZER AMP

BIAS CONTROL CIRCUIT

FADE CONTROL CIRCUIT

BIAS OSCILLATOR CIRCUIT

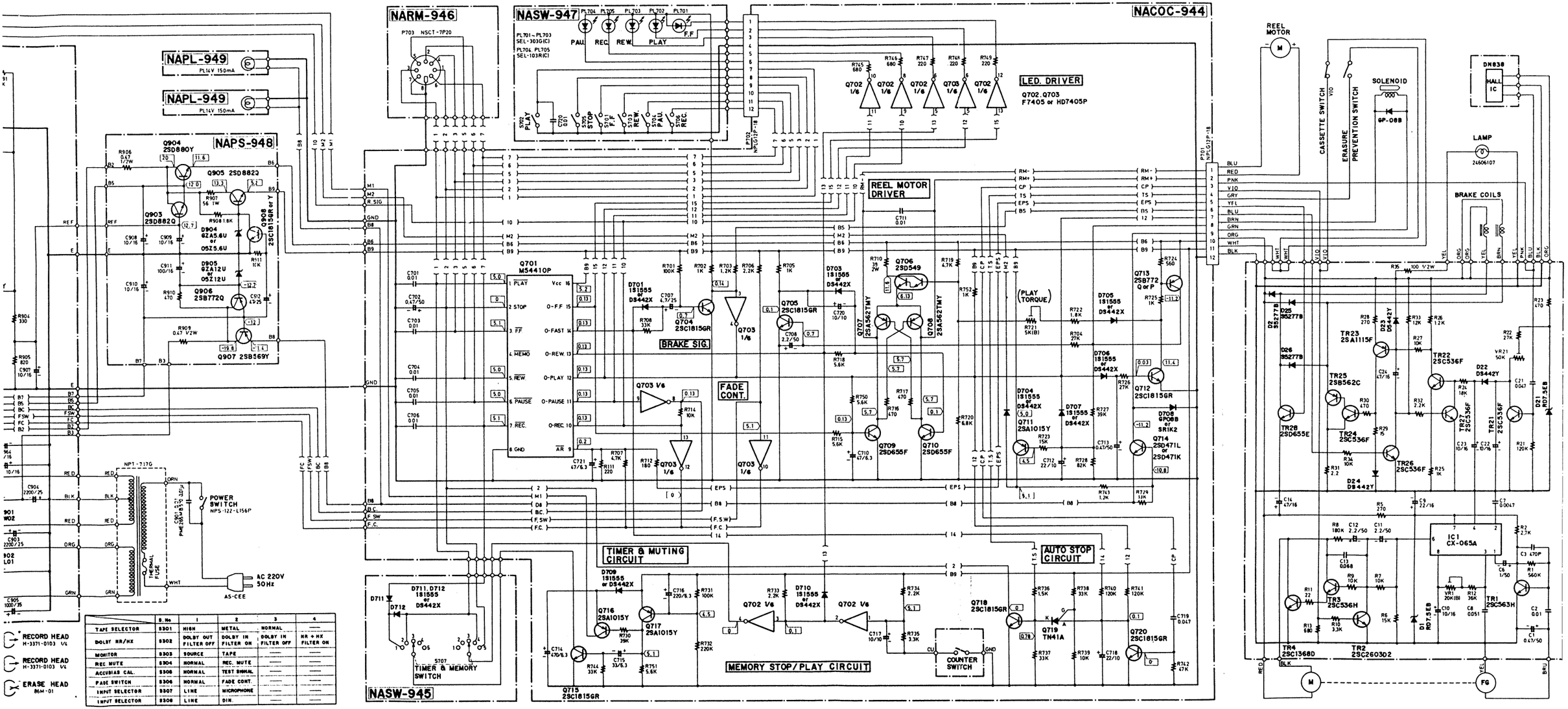
TIMER & MUTING CIRCUIT

BRAKE SIG.

POWER SWITCH NPS-122-L156P

AC 220V 50Hz AS-CEE

	S.No	1	2	3	4
TAPE SELECTOR	S301	HIGH	METAL	NORMAL	—
DOLBY NR/HX	S302	DOLBY OUT FILTER OFF	DOLBY IN FILTER ON	DOLBY IN FILTER OFF	NR + HX FILTER ON
MONITOR	S303	SOURCE	TAPE	—	—
REC. MUTE	S304	NORMAL	REC. MUTE	—	—
ACCUBIAS CAL.	S305	NORMAL	TEST SIGNAL	—	—
FADE SWITCH	S306	NORMAL	FADE CONT.	—	—
INPUT SELECTOR	S307	LINE	MICROPHONE	—	—
INPUT SELECTOR	S308	LINE	DIN.	—	—

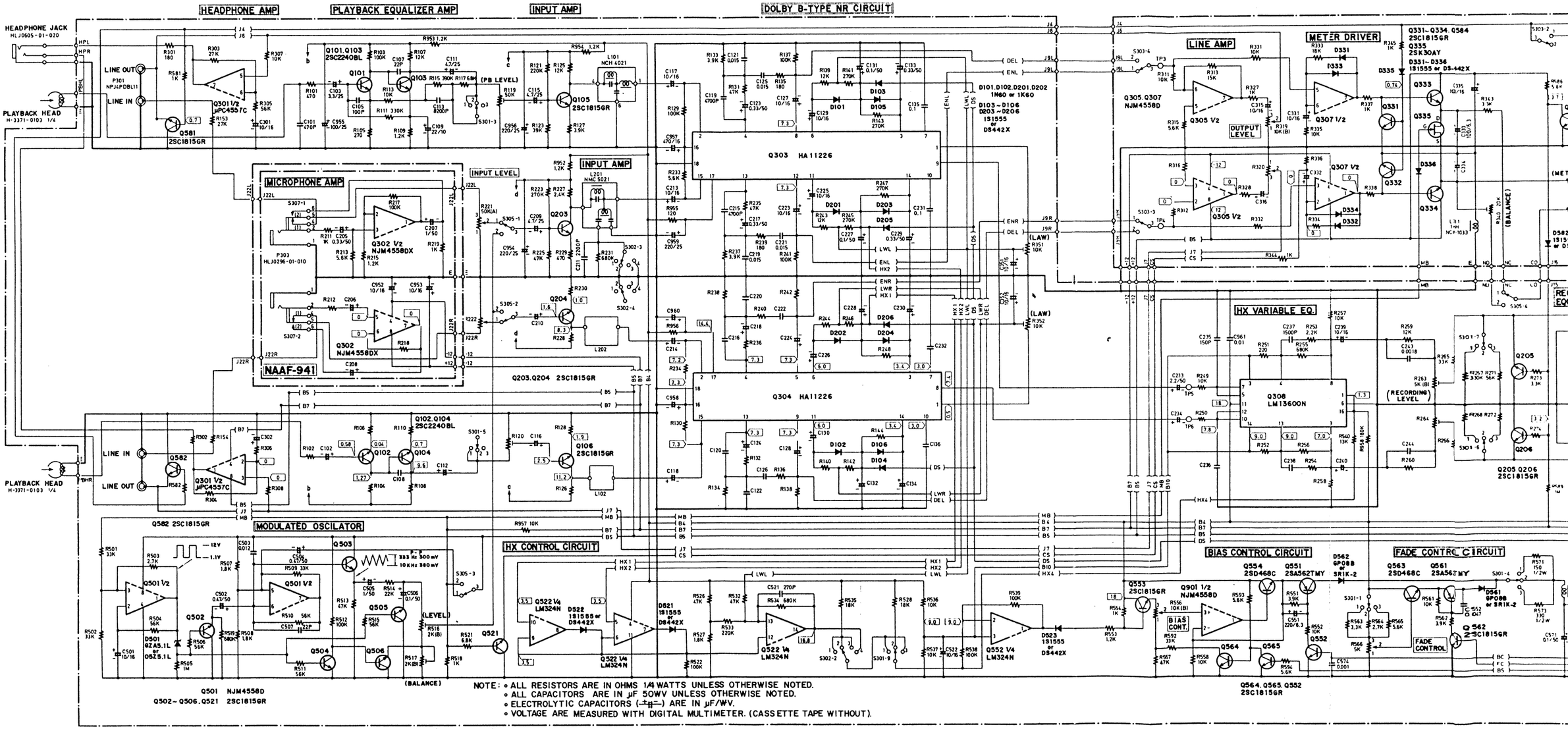


	S.No	1	2	3	4
TAPE SELECTOR	S501	HIGH	METAL	NORMAL	——
DOLBY NR/HX	S502	DOLBY OUT FILTER OFF	DOLBY IN FILTER ON	DOLBY IN FILTER OFF	NR + HX FILTER ON
MONITOR	S503	SOURCE	TAPE	——	——
REC MUTE	S504	NORMAL	REC. MUTE	——	——
ACCUBIAS CAL.	S505	NORMAL	TEST SIGNAL	——	——
FADE SWITCH	S506	NORMAL	FADE CONT.	——	——
INPUT SELECTOR	S507	LINE	MICROPHONE	——	——
INPUT SELECTOR	S508	LINE	DIN.	——	——

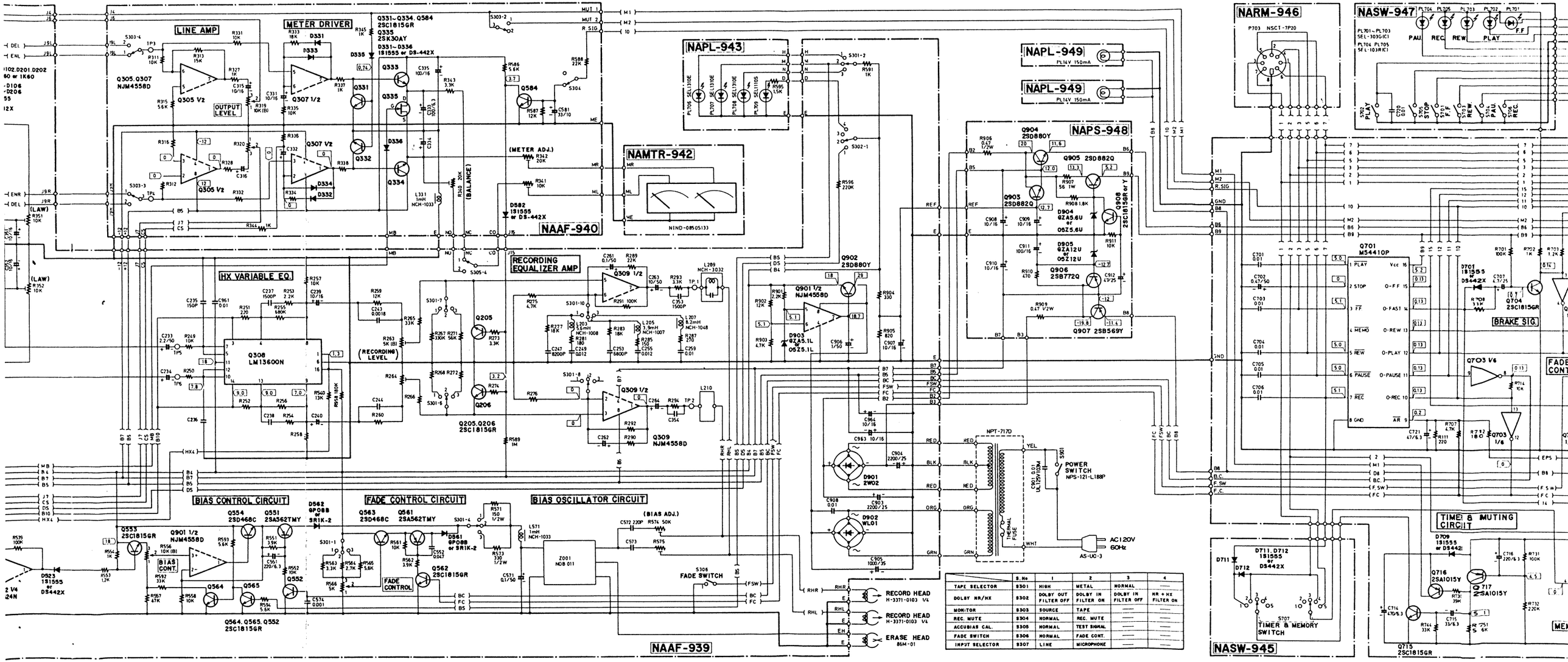
ONKYO CORPORATION

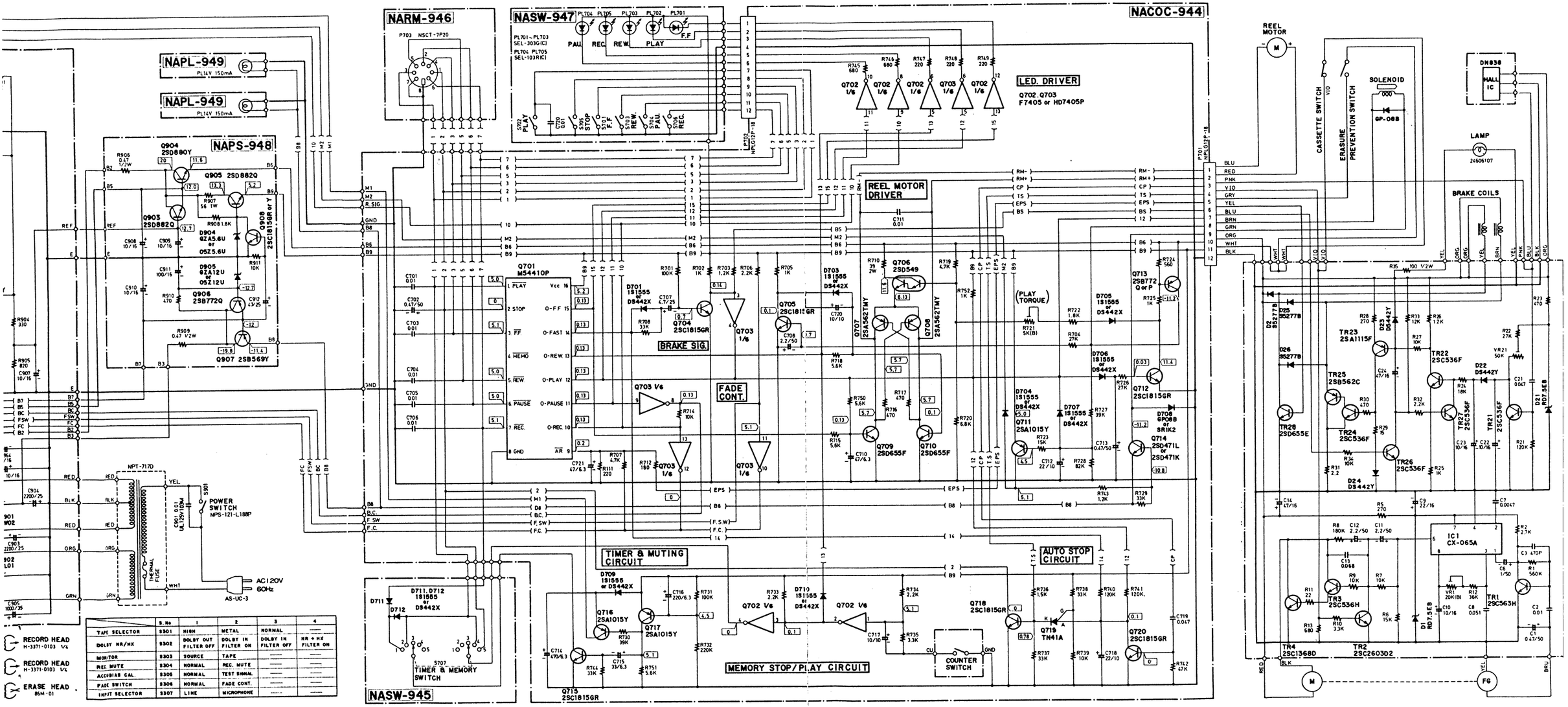
SCHEMATIC DIAGRAM

120V model



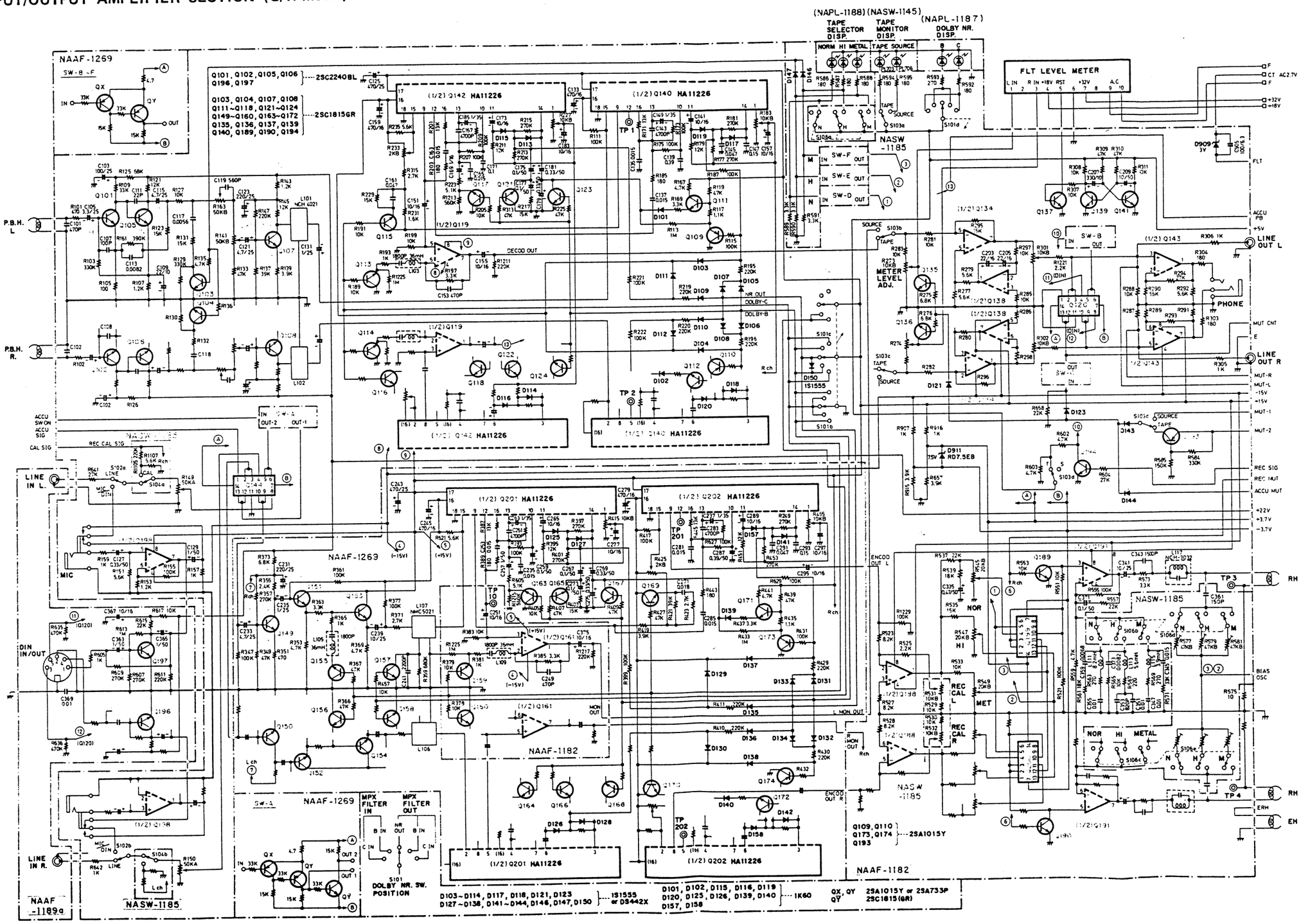
NOTE:
- ALL RESISTORS ARE IN OHMS 1/4 WATTS UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN μF 50WV UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (⊣⊢) ARE IN μF/WV.
- VOLTAGE ARE MEASURED WITH DIGITAL MULTIMETER. (CASSETTE TAPE WITHOUT).


NAAF-940
NAAF-939
NAMTR-942
NAPL-943
NAPL-949
NAPS-948
NARM-946
NASW-947
NASW-945
LINE AMP
METER DRIVER
OUTPUT LEVEL
HX VARIABLE EQ.
RECORDING EQUALIZER AMP
BIAS CONTROL CIRCUIT
FADE CONTROL CIRCUIT
BIAS OSCILLATOR CIRCUIT
TIMER & MUTING CIRCUIT
Q305.0307 NJM4558D
Q305 V2
Q307 1/2
Q307 V2
Q331~Q334. Q584 2SC1815GR
Q335 2SK30AY
D331~D336 1S1555 or DS-442X
(METER ADJ.)
(BALANCE)
Q308 LM1600ON
Q205 Q206 2SC1815GR
Q309 1/2 NJM4558D
Q309 NJM4558D
Q901 1/2 NJM4558D
Q902 2SD880Y
Q903 2SD882Q
Q904 2SD880Y
Q905 2SD882Q
Q906 2SB772Q
Q907 2SB569Y
Q908 2SC1815GR or Y
D901 2W02
D902 WL01
D903 6Z4.7L or 05Z5.1L
D904 6ZA5.6U or 05Z5.6U
D905 6ZA12U or 05Z12U
NPT-717D
POWER SWITCH NPS-121-L188P
AC120V 60Hz
AS-UC-3
THERMAL FUSE
Q554 2SD468C
Q551 2SA562TMY
Q553 2SC1815GR
Q564 Q565 Q552 2SC1815GR
Q563 2SD468C
Q561 2SA562TMY
Q562 2SC1815GR
D562 6P08B or SR1K-2
D561 6P08B or SR1K-2
Z001 NOB 011
S308 FADE SWITCH
(BIAS ADJ.)
RECORD HEAD H-3371-0103 V4
RECORD HEAD H-3371-0103 V4
ERASE HEAD 86M-01
Q701 M54410P
D701 1S1555 or DS442X
Q703 V6
Q704 2SC1815GR
BRAKE SIG.
Q716 2SA1015Y
Q717 2SA1015Y
Q715 2SC1815GR
D709 1S1555 or DS442
D711.D712 1S1555 or DS442X
S707 TIMER & MEMORY SWITCH
PL701~PL703 SEL-3030(IC)
PL704 PL705 SEL-1031R(IC)
PLAY
REC
REW
F.F
PAU.
STOP
P703 NSCT-7P20
PL14V 150mA
NIND-0850S133
SEL1310E
SEL1110S
S303-1 S303-2 S303-3 S303-4 S303-5 S303-6
S301-1 S301-2 S301-5 S301-6 S301-7 S301-8 S301-10
S304 S305 S306 S307
S701 S702 S703 S704 S705 S706
MUT 1 MUT 2 R.SIG
REF
FADE CONT.
BIAS CONT.
(LAW)
(ENR) (DEL) (ENL)
RECORDING (RECORDING LEVEL)
TAPE SELECTOR
DOLBY NR/HX
MONITOR
REC. MUTE
ACCUBIAS CAL.
FADE SWITCH
INPUT SELECTOR
S.No 1 2 3 4
S301 HIGH METAL NORMAL
S302 DOLBY OUT FILTER OFF DOLBY IN FILTER ON DOLBY IN FILTER OFF NR + HX FILTER ON
S303 SOURCE TAPE
S304 NORMAL REC. MUTE
S305 NORMAL TEST SIGNAL
S306 NORMAL FADE CONT.
S307 LINE MICROPHONE


NARM-946
NASW-947
NACOC-944
NAPL-949
NAPL-949
NAPS-948
NASW-945
LED. DRIVER
Q702, Q703
F7405 or HD7405P
REEL MOTOR DRIVER
FADE CONT.
BRAKE SIG.
TIMER & MUTING CIRCUIT
AUTO STOP CIRCUIT
MEMORY STOP/PLAY CIRCUIT
COUNTER SWITCH
TIMER & MEMORY SWITCH
POWER SWITCH
NPS-121-L188P
AC120V 60Hz
AS-UC-3
REEL MOTOR
SOLENOID
LAMP
BRAKE COILS
CASSETTE SWITCH
ERASURE PREVENTION SWITCH
HALL IC
RECORD HEAD
RECORD HEAD
ERASE HEAD
TAPE SELECTOR
DOLBY NR/NX
MONITOR
REC MUTE
ACCUBIAS CAL.
FADE SWITCH
INPUT SELECTOR

SCHEMATIC DIAGRAM

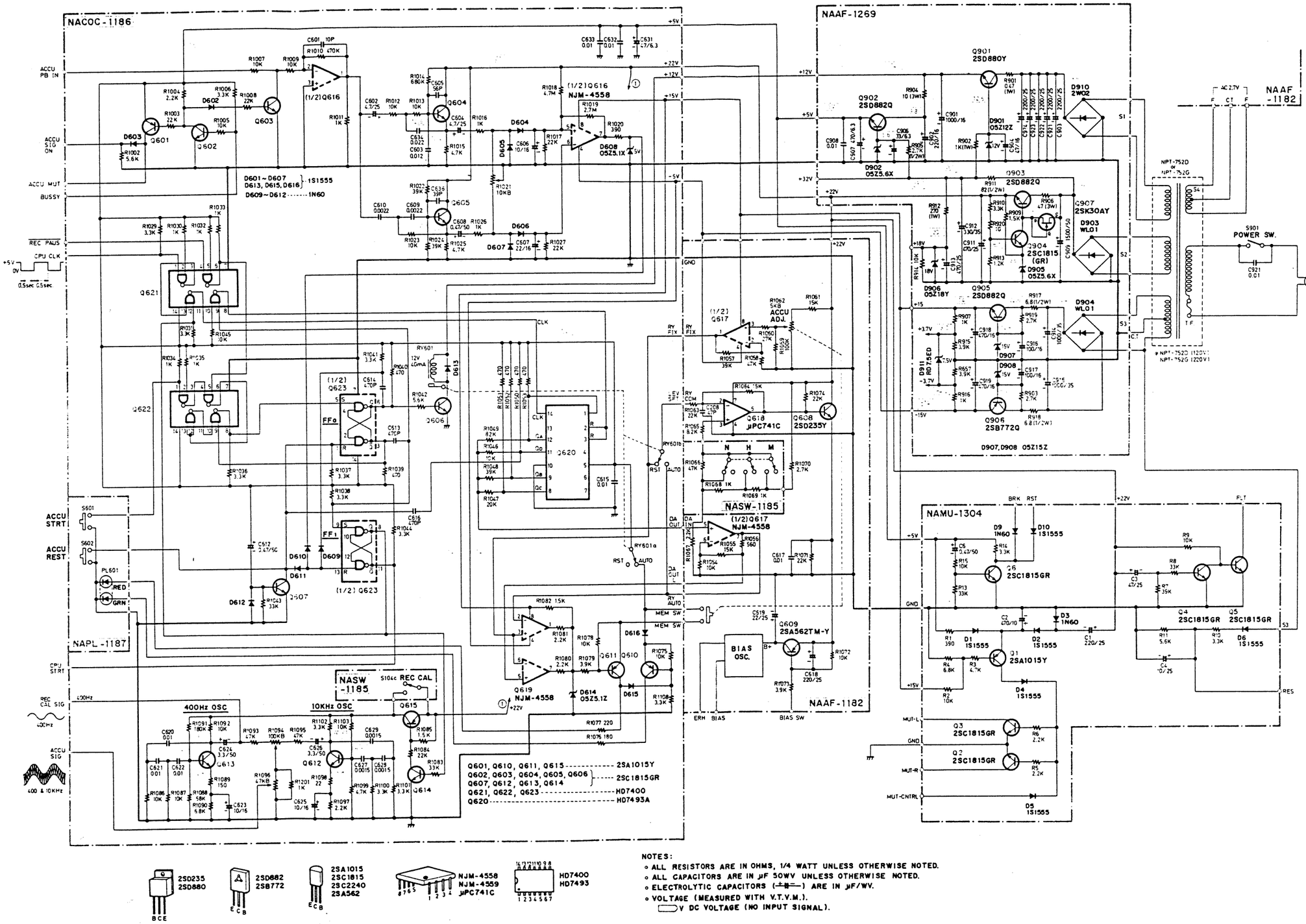
LINE INPUT/OUTPUT AMPLIFIER SECTION (G/W model)



ONKYO CORPORATION

SCHEMATIC DIAGRAM

POWER SUPPLY AND ACCUBIAS CIRCUIT SECTION

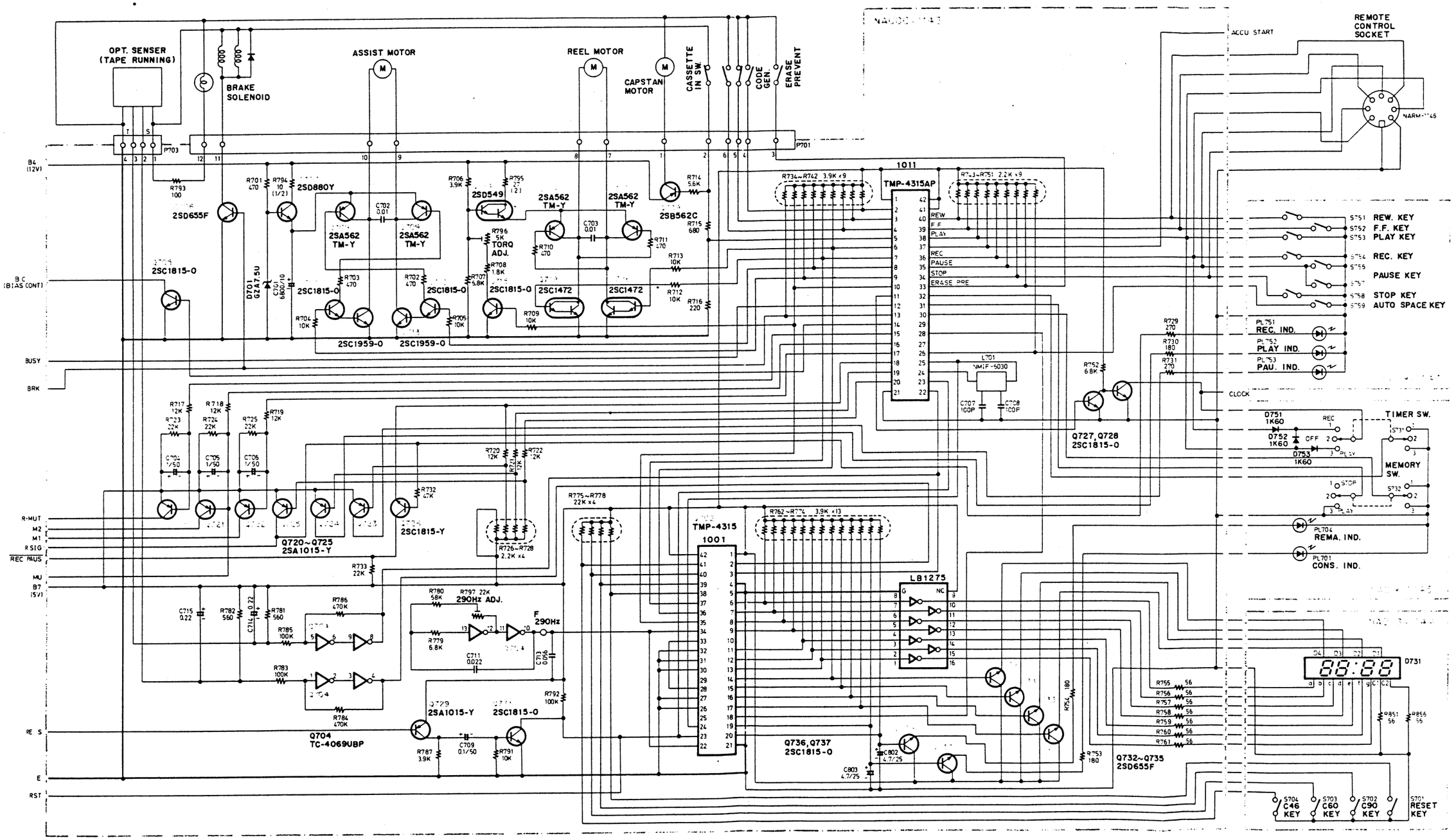


NOTES:

- ALL RESISTORS ARE IN OHMS, 1/4 WATT UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN µF 50WV UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (+ —) ARE IN µF/WV.
- VOLTAGE (MEASURED WITH V.T.V.M.).
  V DC VOLTAGE (NO INPUT SIGNAL).

SCHEMATIC DIAGRAM

CONTROL SECTION



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